FOOD DIGEST

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National Information Centre for Food Science and Technology
Central Food Technological Research Institute,
Mysore — 570 013, India

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RAW MATERIALS

Nil

1

STORAGE AND INFESTATION CONTROL

1 Grain silo chiller reduces losses

Grain losses experienced in steel silos as a result of temperature rise, increased relative humidity, germination, rotting and insect activity can be avoided easily and safely.if the product is cooled immediately after harvesting.

Wheat having a water content of 16% and cooled to a temperature of 10 C by means of a Granifrigor grain chiller from Sulzer Escher Wyss Lindau (FRG) can be stored for a period of 6 to 8 months without any signifcant rise in its temperature.

A storage temperature of 10-12 C not only eliminates temperature and moisture irregularities, but also prevents condensation on the walls of the silo at night and on cold days. The cold preservation of grain creates unfavourable conditions for insect activity and stops their propagation. Since every cooling process has a drying effect, there is also a considerable reduction in fuel costs.

The Granifrigor is a mobile, ready-to-connect unit for cooling of all granular products, eg, seed grain, barley for malting, bread cereals, fodder cereals, sorghum, maize, rice, sunflower seeds, rape-seed, flax, soyabeans, coarse soyabean meal, peanuts, leguminous plants, grass seed, coffee and cocoa beans, nuts, expellers, potatoes, as well as components thereof for the concentrated feedstuffs industry. Special cases of application include dried citrus peel, animal bone-meal briquettes, granulates, etc.
(Food Technology in New Zealand 18(6); 1983; 31)

2 Silo discharging system

Sluis offer a system of discharging silos in which flow-resistant products or ones difficult to discharge are stored. With the Aerovib system vibration and aeration make it possible for cohesive and fluidisable bulk products, such as potato flour, powdered milk, tapioca and soya flour, rape meal and icing sugar, to be discharged in a continuous stream. The Aerovib

is a vibrating floor suspended flexibly at the bottom of a silo. Vibration and aeration take place simultaneously. When the product is set in motion by vibration the bottom layer begins to behave like a liquid, under the influence of air fed in near the floor, and can thus be easily removed from the silo. The air feed is provided by a fan which requires an installed power of 1 to 2 HP, depending on the size of the silo. The air enters the silo via a porous plate (made of sintered bronze or plastic) which is also situated at the bottom. Because of the flexible suspension of the vibrating floor on the silo wall, the vibrations are transmitted to the silo and do not cause settlement in the bulk product. Depending on the capacity required and the load on the floor, one or two vibration motors are used with an average rating of 1 HP. The size of these floors depends on the diameter of the silo and can range from 50 to 300 cm.
(Industrial Products Finder 11(11); 1983; 31)

3 Fijian crystallized papaya

One way to preserve papaya is crystallize it. Here is a Fijian way of crystallizing papaya. Items needed are 1 medium size green papaya, 2 cups of sugar and 2 cups of water. Peel and cut the papaya into small slices. Pour boiling water over the slices and let stand for 10 min. Strain off water and dry the slices with a cloth. Dissolve 1 cup of sugar in 2 cups of water and bring to a boil. Add the papaya slices to the sugar water and simmer until they become almost clear in colour. Remove the papaya slices, place on a tray, sprinkle with sugar and let dry in the bright sunlight for 1-2 days. If flies are a problem, cover with netting. Store crystallized papaya slices in a tightly sealed jar, tin or plastic bag.
(Asia Pacific Technology Digest 4(2); 1983; 12-13)

FOOD ADDITIVES

4 Annatto food colours

Eight annatto food colours, for use in colouring baked foods, cheese, process cheese, cereals, snack foods, coffee creamers, sausage casings, beverages, seasonings, ice cream, confections, and oils, are described in separate product information sheets brought out by Miles Laboratories, Inc. Specificiations for water soluble, oil soluble, water and oil/oil and water

soluble, acid soluble, and T type (blends of annatto extracts with turmeric oleoresin) annatto food colours are given.
(Food Technology 37(9); 1983; 76-77)

5 Reducing sodium content in food

Sodium content of foods can be reduced up to 60% by using meat, seafood, and poultry natural food bases to replace salt as a general food seasoning. While the food bases are not low-sodium products, they effectively lower sodium content and improve flavour when used to season a wide variety of formulations. Food bases are available in beef, ham, pork, chicken, turkey, lobster, fish, shrimp, and clam. The bases are both heat- and freeze-thaw stable and easily combine with other dry or liquid ingredients. A pound of food base reconstitutes in boiling water to make between 4 and 5 gal of complete, seasoned stock.
(Food Technology 37(11); 1983; 70)

6 Artificial butter flavour

Artificial butter flavour 60-1108 developed by National Starch and Chemical Corporation is a concentrated mixture of flavour components blended to give a balanced flavour profile that simulates the taste of butter. The butter flavour is not lost in a caustic bath (such as in the production of pretzels) or during baking, and the flavour can be added to baked foods, extruded snacks, or processed foods. The flavour is recommended for use at a level of 0.5%, and it is available in a vegetable oil-base and as a water-soluble powder.
(Food Technology 37(11); 1983; 68)

7 Aluminium from foods/additives

It has been estimated that Americans and Europeans may consume between 2 and 160 mg of aluminium daily from naturally occurring sources in foods. In a research at the Nutritional Sciences Department of the University of Wisconsin, Madison, determined the effects of 125 mg aluminium/day (as aluminium lactate) fed to eight adult males, average age 25 years, over a 20-day period. Subjects served as their own controls during another 20-day period, during which they were fed 4.6 mg aluminium/day. On the test diet more than 96% of aluminium was excreted in feces; on the control diet more than 74% was excreted. Urinary excretion of aluminium was two- to five-fold greater

on the test diet than on the control diet, and plasma serum levels of aluminium were also greater on the test diet. No retention of aluminium was detected when fecal and urinary losses of aluminium were compared with intakes.
(Food and Chemical Toxicology 21(4); 1983; 473-477)

8 New sweetener approved for use in soft drinks

The U.S. Food and Drug Administration has approved Searle's low-calorie sweetener. NutraSweet (aspartame), for use in carbonated soft drinks in the United States. NutraSweet is a new kind of low-calorie sweetener made of amino acids which occur naturally in much of the normal food supply. It contains no saccharin, sugar or other sweetener.

In its approval decision, the FDA said, "The administrative records show that the Regulatory approval is supported by more than 100 studies on the safety of aspartame and its decomposition products...All of these studies have been thoroughly reviewed by FDA scientists".

In its approval the Agency also said, "The FDA, having evaluated the data in the petition and other relevant material, concludes that the proposed food additive use is safe..."
(Food Production Management 106(2); 1983; 32)

9 UHT beverage stabiliser

Grundy Thompson Food Services have developed an improved beverage stabiliser system especially suited for ultra high temperature (UHT) processing. The new stabiliser, GEM 494 (UHT), is in addition to GEM 49, which is used in drinks that are cold packed or undergo only mild heat treatment. The new stabiliser has been designed for processing at higher temperatures - upto UHT.

Both stabilisers are claimed to replace colloids lost during processing of juices by concentration and freezing. Their action is provided by an imperceptible increase in viscosity and an electrostatic charge on the pulp and other colloidal matter, resulting in uniform texture which in turn influences the perception flavour.
(Food Technology in Australia 35(2); 1983; 553)

10 New fruit juice drink stabiliser

Davis-Germantown has developed a fruit juice drink stabiliser, Gemcol FJ. designed to impart mouthfeel and body and to assist the stabilisation

of natural clouding particles in products where the original pectic or colloidal material may have been lost or degraded. The stabiliser may be used in other acidified drinks because of stability to acid conditions without inducing clarification. The standard grade is designed for operations with good mixing facilities for dry ingredients, and the second, Gemcol FJC, is for those situations where less than ideal agitation is available. Davis-Germantown consider the product to be cost effective and are able to demonstrate the value of Gemcol FJ to interested manufacturers.
(Food Technology in Australia 35(10); 1983; 444)

PROCESSES

11 Cryogenic grinding for spices and herbs

The excessive heat while grinding spices/herbs causes loss of flavour and aroma. M/s. Air Products Ltd., St. George's Square, New Maiden, Surrey KT 34 HH (UK) claims that they have developed technology to retain original flavour and aroma by reducing the heat through cyrogenic grinding. The products such as nuts, coffee, spices, herbs which cannot be washed or heated to keep away harmful germs/bacteria/insect can be preserved hygienically by treating them with ethylene oxide in a gas-tight store/chamber. The ethylene oxide is pumped into the store and is left for upto 24 hours. This gas treatment does not affect the taste or quality.
(Spices Newsletter 17(12); 1983; 5)

12 Spanish new ham technology

The traditional method of producing ham-de-boning, defatting, injection, tumbling, moulding and cooking-is not the most efficient way of handling a very perishable product. Along with the cost of the very considerable labour element, the process results in a yield loss. No matter how carefully the meat is treated, shelf life under refrigeration is not normally more than 5 to 6 weeks.

From Metalquimia Company comes a novel, high-pressure injector which, combined with a new type of sophisticated pulmonary reactor developed by the same Spanish company, process the meat with a gentle and controlled action to ensure maximum take-up of brine solution.

The multi-needle injector features 68 needles, each needle carrying 10

microscopic holes and measuring 0.6 mm in diameter. Brine is injected only when the needle has reached the end of its travel and tests have shown that the brine solution is virtually atomised. In this way, it travels some 10-12 mm from the point of injection and, allied to the large number of needles used, ensures that there are no over-brined patches or dead spots.
(Asia-pacific Technology Digest 4(3); 1983; 10)

13 Wisconsin scientists study colour loss in canned foods

Scientists have known for some time that canned green vegetables acquire a duller hue when hydrogen replaces the magnesium in chlorphyll to form pheophytins. But von Elbe and co-worker S.J. Schwarts recently found that the process of chlorophyll degradation is not quite that simple.

Other chemicals (pyropheophytins) are also formed when chlorphyll breaks down. The relative amounts of both types of compounds depends on temperature and acidity during processing. Both compounds have the same effects on colour.

The information should help the canning industry prevent degradation of chlorphyll and perhaps bolster consumption of canned vegetables. For example, canning firms are now studying containers which release small amounts of magnesium to preserve chlorophyll's distinctive colour.

Von Elbe notes that frozen vegetables might contain slightly more nutrients than canned vegetables, but they contain essentially equivalent amounts after frozen vegetables are cooked.
(Food Production Management 106(4); 1983; 18)

14 Ion exchange separators for corn syrup, dextrose and others

Ion exchange resins called Dowel™ Monosphere developed by Dow Chemicals, USA, may be used to carry out chromatographic separations in commercial processes, such as in the production of high fructose corn syrup, dextrose, amino acids, and polysaccharides. Because the resins feature uniform bead size, they provide a uniform and tightly controlled diffusion rate for the process stream.
(Food Technology 38(1); 1984; 135)

15 Improved process for upgrading the quality of white sesame seeds (Til)

The Regional Research Laboratory (RRL), Jammu has developed a technique to improve the quality of til.

Systematic investigations carried out have led to the development of an improved technique involving the use of harmless low priced chemicals with a contact time of 3-4 minutes only. The processed product is bright white with no residual chemicals or foreign flavour. The demonstration samples have been highly appreciated by the entrepreneurs; and the process has been released by the laboratory. The improved process can conveniently be followed within the existing processing set up of the industry. Cost of cleaning is lesser than the conventional technique.
(Spices Newsletter 7(12); 1983; 8)

16 Clarification technique for apple juice concentrate

A patented hot clarification technique for production of apple juice concentrate is currently being introduced to the U.S. market by Rohm Tech Inc.

The process decreases the production time and energy required by other methods and yields a clear, haze-free juice.

Conventional, or cold apple juice clarification involves many different temperatures and thus calls for large heating and cooling capacities. For most of the processing time, the temperatures are optimal for the growth of yeast.

Rohm's patented HC process takes only 2½-3 hours compared to conventional methods. Moreover, as with most foods, shorter processing time helps to preserve the apple's flavour, aroma and nutrients.
(Food Production Management 106(3); 1983; 17)

17 Mushroom canning

Mushroom, a rich source of protein, is highly perishable. Those that could not be consumed within 48 hours would have to be preserved by drying or canning.

From the National Institute of Science and Technology of Phillippines, comes this simple process of mushroom canning. Clean the mushrooms very well, sort according to sizes and wash with water. Blanch the mushrooms in boiling water for three minutes. Ensure that the mushroom blancher has a cover to prevent the mushrooms from bloating. Drain and dispense in the can with the desirable weight. Put hot brine solution (2-3%) until the water is about 1 cm from the rim. Put the cans in exhausting pan with 70% water. To facilitate the removal of air-bubbles, spatula may be used along the sides of the

can at different points. Put the can cover and seal with can seamer. Sterilize in the pressure cooker or retort at 10 psi for 20 minutes. Remove the cans suddenly from the sterilizer and dip it in cold water until the bulging ends assume normal shape. This process will prevent over-cooking of the mushrooms and at the same time give a shock treatment to some organisms that might survive the sterilization pressure and temperature. Store the cans in a dry, warm place for 14 days. Those that shows bulging ends have to be discarded. Others can be labelled and marketed. Mushrooms may stay in good condition for years, but normally canned mushrooms should be consumed within 6 months from the canning date.

(Asia-pacific Technology Digest 4(3); 1983; 13)

18 Bottling of coconut water

In this process, ripe coconut water is brought to the processing plant immediately after breaking the coconut and subjected to heat treatment under controlled conditions. This is followed by filtration of the liquid to remove any precipitated solid matter. The filtered liquid is then stored in a tank to serve as feed tank to the liquid filling machine. Prior to filling, the bottles are cleaned with a brushing machine followed by washing in cold water and then sterilizing in hot water or in a jet of steam. The filled bottles are then sealed by standard crown cork with a crown corking machine. In case carbonation is desired, a carbonating machine can also be incorporated for supplying carbonated beverage. After bottling and crown corking the bottles are cooled to room temperature either by exposing them to running water, or by keeping them immersed in flowing water in cement or concrete tanks.

Investigations were carried in the laboratory on a scale of 10 litres per batch and 10 batches per day producing 500 bottles per day.

The raw materials and utilities required for producing 1000 bottles of the product are coconut water 200 litres, sugar 6 kg, crown corks 1000, some chemicals, process water 2000 litres, power 10 kW and steam 160 kg.

The main items of equipment required are pasteurizer, centrifuge, bottle filling machine, bottle washing machine, boiler, storage vessel, centrifugal pumps, etc. All these items are indigenously available.

The investment on such a plant is estimated at Rs.4 lakhs (plan and equipment Rs.3.5 lakhs; working capital Rs. 0.5 lakhs), excluding the cost of land and building.

The cost of production works out to Rs.1.32/bottle.
(Invention Intelligence 18(6); 1983; 259)

19 Philippine guava juice

Due to the abundance of guava in the region, many households have learned to produce guava products such as cheese, jelly and juice. For beginners who may wish to make guava juice, here is a recipe provided by the Livelihood Programme of the National Science and Technology Authority. Wash 50 ripe guavas. Slice to small pieces. Add 2 cups of water to the guavas. Boil for 15 minutes or until the guavas become soft. Crush the boiled guavas. Put the guavas in a cloth and strain the juice. Add sugar to the juice according to one's taste. For every 4¼ cups of juice, add ¼ to ½ teaspoon of sodium benzoate that has been dissolved in water. Heat the juice in a casserole at 85 C for 5 minutes while stirring the juice. While hot, pour the juice in glass jars and close. Boil the glass jars for 20 minutes. Remove and keep the jars in a cool place.
(Asia-Pacific Technology Digest 4(2); 1983; 4)

20 Small food factories could cut energy consumption

Smaller food processing factories could make more use of heat recovery systems to conserve energy, according to a recently completed study of energy use in food factories. A report of the study, in the Food Technology Research Centre Newsletter, states that 79 per cent of the factories surveyed reported no installation of heat recovery equipment and most of the systems in use were in large factories.

The survey, by Philip Hulse of the Food Technology Research Centre, Massey University, covered all food processing activities except dairy companies and export meat works. Questionnaires were completed by 53% of the 215 factories surveyed. Comparison of data with previous surveys showed a consistent decline in oil consumption - from 74% of total energy usage in 1974/75 to 52% in 1981/82. Oil was mainly replaced by gas.

Natural gas usage increased from 2% to 18% for the same years, while coal usage remained static at 18% of the total. Electricity usage increased, mainly due to conversion from oil to electricity in smaller factories.

The study indicated awareness of the need to save energy - nearly half of the factories surveyed had made changes to their plant in the last decade which had resulted in energy savings. Energy savings from lagging programmes

to reduce heat losses were generally shown rapidly to repay the capital expenditure required. Energy had also been saved by the purchase of new, more energy efficient equipment or by improved operation of existing equipment. A full report of the study will be available in about two months from the Food Technology Research Centre.
(Food Technology in Newzealand 18(9); 1983; 3)

21 Iodised salt process

The Central Salt and Marine Chemicals Research Institute (CSIR) at Bhavnagar had developed a simple process for preparing iodised salt which can be effectively used in prevention of goitre. In the process, common salt is submerged in saturated brine, containing 250 to 300 mg of calcium iodate per litre. The resultant mixture, after being drained, contains salt which has 15 mg of iodine per kg. The salt has been tested by the National Institute of Nutrition, Hyderabad, which has recommended its use for goitre control.
(Economic and Commercial News 14(4); 1984; 11)

BYPRODUCTS AND WASTE UTILIZATION

22 Gur from jowar stems

Gur can now be produced from jowar stems. The Nimbkar Agriculture Research Centre at Phaltan in Maharashtra's Satara district has evolved a process by which 25 quintals of gur can be obtained from the standing crop of jowar in one hectare, in addition to the normal 25 quintals of jowar.
(Hindu January 25, 1984; 16)

PROCESSED PRODUCTS

23 Dried yoghurt powders

Yoghurt powders which are said to look and taste like natural yoghurt when reconstituted with water have been developed by AB Milkfood of Kagered, Sweden. Rich in protein and nutrients, they are valuable substitutes for milk, especially in countries where milk is in short supply. AB Milkfood will also licence processes and marketing rights so that countries can make their own dried milk and yoghurt powders.

The base product is a powder made from dried, fat-free yoghurt, called

Yogovit. Skimmed milk is fermented with a culture of selected strains of *Lactobacillus* and *Streptococcus*. The product of fermentation is then spray dried by a process developed by AB Milkfood. The result is a powder with a shelf life of up to 1 year containing a large number of live bacteria. After adding fats and thickening agents, Yogovit can be used to make a large number of instant yoghurt products ranging from plain drinking yoghurt to sophisticated medical preparations.
(Food Technology in Australia 35(8); 1983; 355)

24 Israeli instant yoghurt powder

The Research Development authority of Ben-Gurion University, BeerSheva, Israel, has developed a new instant yoghurt drink powder that looks, feels and tastes like natural yoghurt.

The yoghurt powder is an acidified dry mix which can be re-constituted quickly with cold milk without curdling the milk proteins. The product is a tasty yoghurt drink which will not deteriorate on standing for relatively longer periods after its preparation.

The powder contains the bacteria *Lactobacillus bulgaricus Streptococcus thermophilus* and *Lactobacillus acidophilus*. The bacteria *Lactobacillus acidophilus*, unlike other species of *Lactobacillus*, is known to be capable of residing in the intestine and combatting harmful bacteria.

It is said to be cheaper on commercial basis than any other similar instant yoghurt drinks of equal volume. The powder does not spoil and does not require refrigeration. It is compatible with various flavouring agents and added fruits.
(Asia-Pacific Technology Digest 4(2); 1983; 14)

25 Cheaper and better alcohol

A new alcohol filtering agent, which also improves taste and smell, has been developed by Alko, the Finnish state-owned alcohol company. Distillers making alcohol from molasses, as in developing countries with sugar factories. can improve quality and purity at lower cost. The filtering eliminates un wanted odours associated with alcohol made from molasses. The filtering substance is offered either in bulk or through licence manufacturing agreements. Potential customers are also being invited to send their samples to Alko for testing. Alko sees the development as a pioneering step forward in quality improvement. Currently, almost 50% of world alcohol produced from sugar cane,

juice or molasses, is considered to be of medium quality.

Alko is exporting its know-how in the fermentation industry throughout the world. A distillery producing 120000 L/day in Hungary, and a new Swedish distillery producing 20000 L/day will open this year. Another turn-key project, in Burma, involved the planning, start-up and test-runs of a molasses distillery producing 5000 L/day will come on stream at the end of 1983.

(Food Technology in Australia 35(8); 1983; 358)

26 Sri Lankan soya flour use

The Rajrath Food Grain Processing Company, Mahaillupallama, is manufacturing Raja Soya, a multipurpose soya flour, which can be used as an extender or replacement for coconut milk. 50 gms of the Raja Soya is equivalent of the milk from a coconut. In combination with wheat or rice flour or in many other dishes - both sweet and savoury - Raja Soya is reported to improve both taste and nutrition.

In combination with cocoa and milk powder, Raja Soya makes a tasty beverage. The soya and milk powders are mixed and made into a paste with warm water. The cocoa powder is now dissolved in it while adding more warm water and stirring. Sugar, as required, is added.

(Asia-Pacific Technology Digest 4(3); 1983; 5)

EQUIPMENT AND MACHINERY

27 Electronic sorting machine

Bichromatic electronic sorting machine - the GB-104A series - may be used to sort dry products such as peanuts, coffee, and tree nuts. The GB-104A is used to remove defective products at capacities ranging from 300 to 850 lb/hr/channel. The machine features variable electronic sorting pattern, air purged electronics cabinet, continually self-cleaning optical housing, and simpler operating and set-up procedures.

(Food Technology 37(11); 1983; 73)

28 Spiral feeder

Utkarsha Engineers have developed a spiral feeder for handling fine powders, pellets and granular material. The device can be portable or fixed, accept products from a number of bunkers/hoppers and deliver to multipoint outlets. The entire system can be enclosed for dust control. The action of the spiral feeder also provides mixing effect which can be used for blending two or more products.
(Industrial Products Finder 11(11); 1983; 45)

29 Onion peeling machine

Backhus Sormac BV, Netherlands, has developed an onion peeling machine that will handle onions with diameters ranging from 40 mm to 100 mm. In operation, pre-graded round onions are passed to the volumetric feed unit, which brings the onions to an aligning section, either in two rows or four. Overfeeding is not possible since surlpus onions fall between the feed rows and are returned to the elevator by a belt.

In the aligning section, rotating discs ensure that the onions are positioned with tops and tails horizontal, and at the end of this section onions are taken by a pin mechanism on a spoked wheel to the pre-cutting knives and double dish knives. The former cut off the tops and tails. Depth of cut can be adjusted to suit the onion quality. Following topping and tailing, onions pass to a roller system for peeling, then on to an inspection table. For a two-track machine, output is around 1250 kg per hour for onions with a diameter of 70-80 mm; and with four tracts this figure can be doubled.
(Asian Food Handling Newsletter No.11, 1984, 11)

30 Centrifugal sifter

Centrifugal sifter for use in food processing is offered by Kason Corp. The new sifter, incorporating a self-purging trash trap, can be used for everything from low-cost scalping at capacities to 30 t/h to the retention of particles as small as 37 microns. Applications include processing of bakery goods, rice, food mixes, soy bean, cereal and dairy products, starch recovery, delumping cocoa, sizing soup mixes, classifying crumbs, and clarifying soya milk in the process of manufacturing tofu. The trash trap is said to permit continuous operation without the need for manual trap compartment cleaning.
(Agricultural Engineering 64(10); 1983; 34)

31 Vegetable coòler

The Indian Council of Agricultural Research has developed an inexpensive cooling chamber for vegetables and fruits. It consists of a wet porus bed through which air is drawn, cooled and humidified by the evaporation of water. About 350 bricks and 10 bags of sand are required to make a chamber with a capacity of 100 kg of fresh fruits and vegetables.
(Kassia Bulletin 23(11&12); 1983; 9)

32 Oil skimming from waste water

Oil skimming system efficiency removes vegetable oils, animal fats, and oily froths from wastewater without drawing moisture along with the grease and oil. The free-floating, closed-loop collector tube utilized in the oil skimming system is made of polyurethane, which attracts oil as it adjusts to the water level and slowly moves over and around floating debris in the tank. The tube is then drawn through scrappers which clean the tube and send it back down to the water surface to gather more oil. The skimmer can be extended as far as 16 ft from the shore line, pit or lagoon edge when it is equipped with a balanced boom system. The skimmer can be outfitted with heating elements to keep the oil moving in cold weather, and ceramic, high-abrasion-resistant drive and wheel and scrapper units provide protection against corrosion from fatty acids. The system has a pick-up capacity of up to 10,080 lb/day for heavy oils; 4,200 lb/day for medium oils; and 1,680 lb/day for light oils or grease.
(Food Technology 37(11); 1983; 74)

33 British improved dewatering

The Willis Europlant Limited has a new solution to difficult dewatering problems: high-pressure dewatering press. Industries concerned with the production of coffee, starch, etc. are always on the lookout for something bette in dewatering processes and equipment since dewatering forms a central point in these industries.

The high-pressure dewatering press, designed by the Vetter of Kassel, is equipped with a motorized hydraulic drive at the discharge end. It is totally dispensed off the traditional motor and gearbox at the feed end. The Vetter press is of stainless steel and have outputs up to 36000 kg/hour, according to the Willis Europlant Limited, who holds the rights of Vetter-designed presses all over UK.

34 Small scale spray drier

Spray-drier system called the PDS Pilot Spray-Drier developed by Bayliss Industries, Inc., is small enough for research and development work, yet it provides reliable scale-up data. The system consists of a 4-ft diameter spray-drier, feed system, exhaust fan with damper, interconnecting ductwork, and a control panel. System air heaters are available in electric, steam, or natural-gas-fired. A wide variety of products can be processed with the system. Atomization is provided through a spray nozzle which can handle a wide range of feed stocks. The evaporative capacity of the system, which operates under negative pressure, depends upon the operating temperatures of the drier. Inlet gas temperatures of up to 1,000 F can be obtained with the natural-gas-fired air heater, and evaporative capacities of 200 lb of moisture/hr can be obtained.
(Food Technology 37(12); 1983; 64)

35 Control system for freeze-driers

The Full Cycle Programmer (FCP) II - is a microprocessor-based unit that can adjust the freeze-drying process during the cycle to save time and to ensure optimal results. The user needs no special computer training to operate the unit. The FCP II has manual override capability and it provides a hard-copy record at the end of each run. This record includes a complete data log that is updated every few minutes during the run, full program documentation, and final run analysis summary. The summary lists how long each stage in the process took, what problems occurred, and any actions the programmer automatically took to correct these problems. The information is displayed on a CRT terminal and is also printed on a high-speed printer for permanent records. The entire FCP II is about the size of a small desk. The system repeatedly can run identical cycles or it can be adjusted according to process requirements. Control modes can vary during each stage of the freeze-drying process to provide gradual rate changes.
(Food Technology 37(12); 1983; 64)

36 Vibrating fluid bed processors

Vibrating fluid bed processors may be used to heat, cool, dry, or moisturize bulk solids. The unit provides efficient processing through the combined use of fluidization and vibration. Fludization is achieved by passing controlled process air up through the material bed of the unit. The material

is percolated like a gently boiling fluid and surrounded by process air. This contact between the material and the process air provides the efficient heat/moisture transfer. Vibration provides the necessary agitation to assist fluidization of some materials which might not otherwise fluidize. Vibration also supplies the forward movement required to process the material on a first-in/first-out basis, and allows the unit to clean itself after each run.
(Food Technology 37(12); 1983; 54)

37 Improved fluid bed dryer

Controlled residence time fluid bed dryer of Proctor and Swartz, Inc., may be used for drying, heating, roasting, and cooling a wide variety of food products such as nuts, seeds, snack products, and cereals. The dryer fluidizes a product on a stationary, porous (usually perforated metal) bed by passing air up through it. The arrangement of transverse flights, attached to side chains that move the product through the dryer permit controlled residence time and uniform treatment for all particles. Since the particles are in a true fluidized state, the heat transfer rate is high, resulting in rapid treatment. The machine may be divided into individual zones for close control of air velocity and temperature.
(Food Technology 37(11); 1983; 73)

38 Dryer-heat pump system

The Ascu industrial dryer-heat pump system is also suitable for drying seed. It is electronically controlled, and needs minimum attention, leaving the operator free to do other jobs. It is available in three sizes: ID-15, ID-30 and ID-75 with water extraction rates of 81.5, 210 and 500 kg per 24 hours, respectively. The operating temperature range is between 30 C and 50 C. ID-15 is also suitable for use in food storage godowns to control moisture and prevent fungal growth. It has inbuilt protection devices such as circuit breakers, current overloads and automatic compressor switches which cut-off when overheated conditions arise. Timing devices and an overheat protector for the heater are the other features.
(Industrial Products Finder 12(1); 1983; 1)

39 Still liquid filler

Hilden's adjustable vacuum filler is suitable for still liquids. Due to the very low range of vacuum used, the loss of spirit and flavour is kept to the minimum. There are no overflow chambers and hence there is no waste of liquids while recycling and refiltering. The filling level can be precisely adjusted to reduce the give-away material. Low horse power is used for the vacuum pump. The machine is built with automatic safety and automatic oil and grease lubrication systems with interlocking warning alarm.
(Industrial Products Finder 11(11); 1983; 99)

40 Rotary bottle filler

Hilden's automatic vacuum-assisted rotary liquid filler is a high capacity bottling equipment for dairies, breweries, distilleries and soft drink and aerated water bottlers. The filler is available with 12, 18, 24, 36 and 48 filling heads, and the 36-head filler fills half-a-litre bottles of milk at the rate of 200 per minute. There is reportedly no overflow, no dripping and bottles fill up to the same preset level. Liquid feed tank, piping and all components in contact with the liquid being filled are of stainless steel. There is central lubrication and a minimum of moving parts for ease of maintenance. A capper is synchronised with the filler either as a composite unit or as a separate one connected by conveyor.
(Industrial Products Finder 11(11); 1983; 18)

41 Aseptic filling system for pastes and flavourings

A unit for aseptically filling presterilized, foil laminate bags, with capacities from 50 to 200 litres, can now be supplied by Webster Griffin Ltd. of Webster House, Dudley Road, Tunbridge Wells, Kent TN1 1LE.

The Manzini Sterile Bag is said to reduce packaging costs and increase product quality. In addition, because they are aspetically packed, the shelf-life of products in the bag can be as high as 15 months or more without refrigeration. The bags can be enclosed in any kind of metal, plastics or paperboard secondary container.

Normally, following sterilization, a pointed product fill-head descends in the chamber, piercing the thin membrane in the bag's seal cap. The bag is then filled with nitrogen or other inert gas at low temperature.

After filling, the fill tube retracts into its chamber and the cap is

heat sealed. The seal area is further protected from contamination by an iodized solution. While the filled container is being removed, the filling head is automatically washed. The operator places the bag in the drum on a scale just under the filling station. Next, the presterilized and completely sealed bag is moved under the vacuum filling head.

Once the vacuum has been drawn, the bag is linked to the filling chamber. Within the filling head chamber, the head itself is sterilized at 70 C for 30 sec.

(Food Trade Review 53(5); 1983; 263)

42 Vertical form fill seal machine

Model GA is a single-tube unit capable of producing from 100 to 120 pouches/min, depending on product and type of film. The Model GA's high speed is made possible by stationary sealing jaws and by feeding the packaging film with a high-speed belt drive. As the drive belts draw the packaging film over the tube former, the power roller feeds exactly the same amount from the parent roll. The prefeeding substantially reduces film stress over the tube former, and reduces the belt drive's work. The synchronized drive minimizes belt slippage against the film, increases belt life, and reduces scuff marks on the film. In addition to high speed, the Model GA provides excellent seals and easier product change-over.

(Food Technology 37(11); 1983; 72)

43 Computerized microwave oven

The Gold Star Company of Seoul, Korea, has developed a microprocessor controlled microwave oven which displays power level, temperature, cooking time and time of day.

The oven can operate in either 4-stage time cooking mode or 3-stage temperature cooking mode by setting the computer programme accordingly. The cooking can be delayed for up to 11 hours and 59 minutes by programming the oven, pressing the delay start pad and setting the desired delay time.

The memory entry and recall system enables the user to store a recipe in the memory of the oven which can be made to repeat automatically when needed. The LED indicators provided show the various stages of cooking that have been programmed into the oven.

In addition, the oven has a temperature probe with indicator lamp which lights up when the food has reached the desired temperature and turns off the

unit. It also has time and number displays which shows the time of day, cooking time, cooking temperature, power level, etc.
(Asia-Pacific Technology Digest 4(3); 1983; 3)

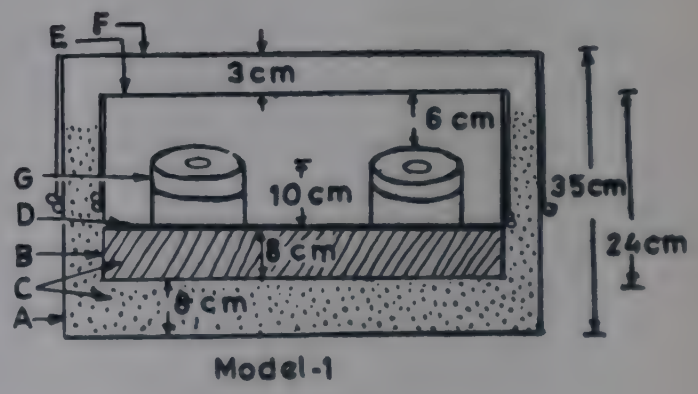
44 Priagni - a low cost stove

Central Power Research Institute, Bangalore, has designed a stove which is cylindrical shaped with metal stands to keep it steady and help in shifting it. At the top there is a circular metal sheet with a cylindrical opening in concentric circles for the flame to come out. At the bottom inside, there is a perforated metal sheet to keep the firewood on so that the air will pass through helping the flame to go up vertically. The inside of the cylinder is lined with aluminium sheeting to reflect the heat and the stand rods will help to minimise the smoke. The only instruction for the housewife is to keep the cut pieces of firewood in a straight line on a perforated sheet. The stove is available in three sizes, the family size costing Rs. 35, the medium size costing Rs. 60 and the large size suitable for restaurants Rs. 78.
(Documentation Bulletin No.53; 1983; 17)

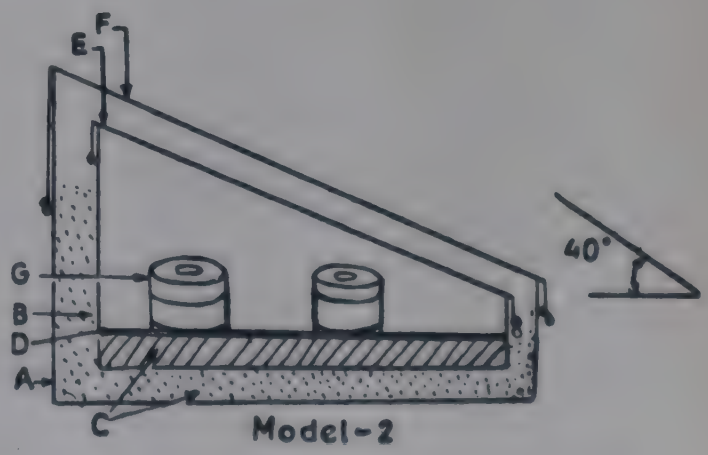
45 Low cost solar cooker for villagers

Solar cookers are viable for atleast 6-9 months in the tropical region for the purpose of cooking. Two models of a disposable type solar cooker based on locally available materials have been designed.

These models can cook only when the ambient temperatures is reasonably high (i.e. atleast 30-40 C or above). Of all the components in the cooker, only the glazings may have to be replaced after a couple of months.
(Invention Intelligence 18(7); 1983; 305-306)



Model-1



Model-2

A-Outer card board box
B- Inner Card board box
C- Insulation
D- Metallic sheet
E-Inner glazing
F-Outer glazing
G-Cooking Vessels

46 Rotating biological contactors for effluent disposal

Effluent from food processing facilities may be treated using Rotating Biological Contactors (RBC) which reduce waste products from starch, sugar, and dairy processing operations. The operating principle of the RBC utilizes a living bio-mass comprised of bacteria, protozoa, and other simple organisms which attach and grow on the media surfaces.

A continuous supply of nutrients from the wastewater and oxygen from the atmosphere allows the bio-mass to thrive, thus effecting removal of pollutants and contaminants from the water. The entire RBC process provides high degrees of purification and nutrification with effluent qualities as low as 5 mg/L BOD. The RBC unit consists of multiple sheets of plastic media mounted within a stainless steel framework attached to a slow speed shaft. These plastic sheets are designed to permit ample space between each media and provide sufficient turbulence when moving through wastewater to achieve the desired levels of liquid mixing and shear. The RBC is partially immersed in wastewater so that 40% of the media is submerged. When the RBC is rotated at a normal operating speed of 1½ rpm, the media is alternately exposed to air and wastewater. As sections of the media rotate out of the wastewater holding tank, some wastewater is also carried out, but immediately starts draining toward the tank. This draining action provides a thin film of liquid permitting high exchange of oxygen from the atmosphere to the liquid and the release of gaseous by-products to the air.
(Food Technology 37(11); 1983; 74)

PACKAGING

47 Modernisation of packing technology

To modernise India's packaging technology, the Union Government has taken two important policy decisions (1) to substitute wood by corrugated fibre boards in such industries as tea, textiles and engineering goods; and (2) to introduce a new compulsory testing programme for export packaging.

The decision to find suitable substitutes for wood has been taken to protect India's forest wealth. The department of environment which studies these issues in collaboration with the Indian Institute of Packaging, found

that the change over from wood to paper-based materials was feasible but it has suggested a gradual shift to prevent any disruption in the distribution process. The changes in export packaging was introduced by the Export Inspection Agency. The Agency which was also incharge of compulsory pre-shipment inspection of most of the export products would extend the scope of its testing from the quality of products to their packaging quality also. The agency would draft specific standards for different commodity packages by entering into a long-term agreement with the Indian Institute of Packaging. *(Kassia Bulletin 23(11&12); 1983; 10)*

48 Bag-in-box system for dry products

Developed in France by Bernhardt CIE, the "Strongbox" bag-in-box system is designed to handle dry, powdered or granular products as well as liquids.

In contrast to liquid bag-in-box systems that have a sealed bag incorporating a filling-dispensing spout, "Strongbox uses an open-top bag sealed only on three sides, allowing it to be used for a wide range of dry products and semi-liquids.

The wide range of sizes encompasses packs with capacities from 3 to 200 liters, the largest size measuring 4 meters x 700 mm wide. But the most common pack sizes for this system in France are 20 liters and below, where it is competing directly with rigid-bulk-container systems. Unit price savings of up to 50% are claimed, in comparison with plastic and metal containers.

As the packages are delivered flat, economies also extend to warehouse space. And when filled, the square boxes utilize space better than cylindrical containers during transportation and storage.

Specification can be tailored to the application, the bags being available in some 12 paper/film material combinations, including foil laminations. Typical laminations include natural and bleached kraft with polyethylene, kraft/PE/foil/PE, Kraft/PE/foil/PE/HDPE, and polyester/PE/foil/PE.

Thus excellent oxygen and moisture barrier properties can be achieved together with conservation of aroma or odour in the pack.

Bags can be supplied in a block-bottom configuration or with guessted side-seams. The unsealed side is heat-sealed after the bag has been filled Case specification depends on application, but the outer case is usually double-walled fluted board.
(Food Engineering International 7(5); 1982; 62)

49 Multineck aluminium can

It is called Q/Light™ and is reportedly the lightest and strongest aluminium can available with Reynolds Co. Q/Light cans provide a metal savings of 1-2 lb/1000 cans compared with doubleneck and singleneck cans. This light weight is possible because the diameter is reduced in four small necks, or indentations, which permit use of an easier draw and iron technique. The strength of the can is partially attributed to its 206 RDS (miniseam) end which includes a ridge in the countersink that increases the pressure resistance against buckling. The Q/Light can is also stackable.
(Food Technology 37(11); 1983; 72)

50 Automatic shrink packaging system

Automatic shrink packaging systems of the Weldotron Corp. for the food industry include the Model 1901 Vertaseal cross-seal shrink packaging system and the compact Model 1462 packaging system. The Model 1901's vertical cross-seal design enables product to be wrapped in an upright position to produce a more attractive over-wrap for high-profile products. The package offers the advantages of tamper-evident protection and high-gloss. The Model 1901 features smooth continuous motion and operates at rates up to 150 packages/min. The Model 1462 automatic shrink wrapping system operates at rates up to 60 packages/min. It is designed for packaging a wide variety of food products including aseptic juices.
(Food Technology 38(1); 1984; 132)

51 High speed automatic wrapping machine

Bakery products, snack foods, confectionery and any other product requiring a heat-sealed, pouch-type package can be wrapped even by inexperienced operators with a new low-cost, high-speed, fully automatic horizontal form-fill-seal wrapping machine available with Gilbert Lodge & Co.

Described as versatile, compact, and simple and inexpensive to operate, the Modupak has an electronic control system with sensitive photo-electric registration control to provide accurate package cut off regardless of film type or print pattern.

It has fingertip variable speed control, and size can be changed quickly by simple detachable parts. A safety overload mechanism protects the machine from damage by obstacles which are caught in between the sealing jaws, which are equipped with a hazard free safe guard.

ANALYSIS

52 Measurement of water activity

Spoilage will occur rapidly if a product is packed when the water content (water activity) is too high. A new and straightforward method for measuring this is now available from Centronic Sales Ltd., U.K. The Rotronic Hygrostat Water Activity Measuring Station is a purpose built system. Each system comprises two parts, a testing station and a digital hygrostat. The WA40 testing station is designed for quick and reliable measurement of the water activity (equilibrium relative humidity) and temperature of small amounts of foodstuff or base ingredients. The device is resistant to alcohol and acid vapours often found in food additives. Digital readouts of both temperature and water activity are given simultaneously on the hygrostat. An adjustable level detector may be interfaced directly to a make-and-break relay thereby enabling the Rotronic Work Station to control on-line processes directly.

(Food Trade Review 53(5); 1983; 264)

53 Moisture content determination

Microwave Heating Ltd. of Unit E, Cradock Road, Skimpot Industrial Estate, Luton, Bedfordshire, have announced a general purpose piece of equipment for the determination of moisture content.

By using microwave energy it is possible to ensure that most waterbased materials are dried readily and effectively. Typical drying times can last from 1 to 6 min. The equipment has a two power setting, such that at the end of the drying cycle a small E field is used to ensure that the product is not burnt. The equipment is simple to operate and produces a print-out giving a start weight, time to half power, final weight, moisture content dry basis and moisture content wet basis, together with a test number.

(Food Trade Review 53(6); 1983; 318)

54 Sugar determination using enzymes

As evidence for a continued commitment to development of new products for food analysis, Boehringer Mannheim Australia has released new kit combinations employing enzymatic methods for sugar determination. Glucose/fructose/sorbitol and sucrose/glucose/fructose kits are now available,

enabling the estimation of fermentable sugars using on convenient kit. The enzyme β-fructosidase (invertase) which is used for sucrose determination, also hydrolyses raffinose and ketose to their respective sugars, thereby allowing their simultaneous analysis. Sorbitol is specifically metabolised by the enzyme sorbitol dehydrogenase to fructose. Both fructose and glucose are then estimated using standard enzymatic methods linked to NADP conversion to NADPH. Results are measured spectrophotometrically at 340 nm.

Test principles, assay methods and sample preparation techniques are available on request from David Beins, Boehringer Mannheim Australia Pty Ltd., 6-8 Byfield Street, North Ryde, NSW 2113.
(Food Technology in Australia 35(4); 1983; 157)

55 Protein analysis

Tighter control on protein levels in the food industry has prompted Foss Electric to introduce the Nitrofoss semi-automatic Kjeldahl system.

The Nitrofoss range comprises two block digestors, incorporating radiant heaters and simmerstat control up to 625 C. The digestors allow a maximum of four and eight digests to be carried out simultaneously with an option switch for two or four respectively.

The equipment has a self-contained fume extraction system, so that digestion can be carried out in an open laboratory, and a distillation unit which dilutes and neutralises the digests and distils steam automatically Final emptying after complete distillation is also automatic. The unit can be used to determine cereal and milk protein by direct distillation or by Ronald's method.
(Milk Industry 85(5); 1983; 9)

56 Purification of proteins

Rapid separation, purification and characterization of proteins using gel filtration is provided by Protein-Pak columns. The columns, which are described in the 4-p brochure "82329/B43/July 1983(2/81)," are packed with a rigid, hydrophilic porous silica gel and manufactured with an exclusive bonding process that improves column stability and minimizes non-specific adsorption. The columns feature high recoveries of total protein, high resolution of globular proteins ranging from 1,000 to 500,000 Daltons, high speed separations, and microgram to milligram isolation capabilities. The brochure discusses the advantages and features of the columns. Contact: Waters Associates, 34 Maple St., Milford, MA 01757 for further information.

57 HPLC method for vitamin analysis

HPLC methods for the analysis of fat- and water-soluble vitamins in cereals, flour products, vegetable products, pet foods, and dairy products are described in a series of application highlights. The application highlights feature HPLC analyses of vitamins A, B,C,D, and E in various food matrices using the QA-1 Analyzer, an HPLC system providing simple operation. The system performs the analyses in less than 15 min. with precision as high as ±3%, and it provides a permanent record of results presented in international units or other units as required. The application highlights discuss operating conditions and supplies required to complete the analysis on the QA-1 Analyzer. To perform the analyses, operators need to load the prepared samples, set the number of samples to be analyzed on a digital thumbwheel, and press the start button. Sample preparation usually requires extracting and filtering the sample.
(Food Technology 37(11); 1983; 64)

58 Microbiological growth analyzer

This can measure levels of bacteria growth in food in 3 hr. The analyzer measures bacterial growth in the culture by monitoring the change in the electrical conductance of the growth medium. Conductance of the cultures, in 112 or 128 sample cells, is repeatedly monitored in sequence. Scan times are programmed from 4 min. to 30 min. Data is collected, stored, and processed by the system's built-in computer. Software is available for many common microbiological applications, including antibiotic sensitivity, minimum inhibitory concentration, and threshold levels. Results can be monitored on a chart recorder or shown in graphic or tabulated form on a visual display. The analyzer is manufactured by Malthus Instruments Ltd., Stoke-on-Trent, England.
(Food Technology 37(9); 1983; 66)

59 Humidity-cum-temperature indicator

Switzer manufacture, in collaboration with Novasina AG of Switzerland, the MIK 2000 portable air humidity-cum-temperature indicator. The sensor directly measures relative humidity in RH and temperature in centigrade. An electronic circuitry, employing latest ICs, aids clear LED display with a rotating dial. The hand-held instrument is suitable for airconditioned

space, green house, meteorological observations, etc. It is powered by a standard 9 V battery.
(Industrial Products Finder 11(11); 1983; 55)

60 Temperature controller

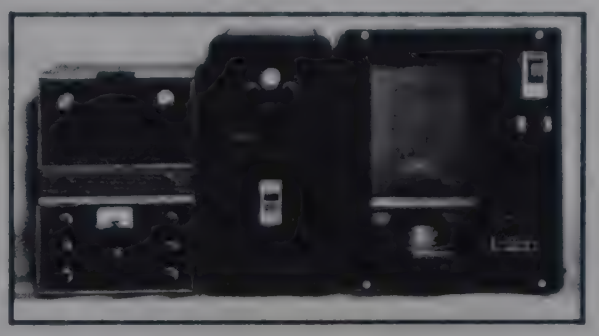
Omega Engineering offer a temperature controller, the Model 6400, packaged in a rugged bench-top case and designed for laboratory systems requiring heating, heating and cooling, or cooling functions. A powerful microprocessor constantly monitors the system parameters and controls the heating/cooling processes by performing a three-mode (PID) control algorithm using the process parameters of cycle rate, rate (derivative action), reset (integral action), and proportional band width (one for heating and one for cooling). Process temperature and set point are constantly displayed in dual LED displays. All controls are fully adjustable from the front panel for high accuracy and their values can be displayed on the second front panel display at the touch of a button. Anti-reset windup is also a standard function. By using the precision controls, a process can be tuned for maximum efficiency and lower heating costs. Pilot processes can be developed using the Model 6400 controller and the control parameters then designed into the process.
(Industrial Products Finder 12(1); 1983; 25)

61 Portable oxygen analyser

This may be used to measure the amount of oxygen in flexible packages and specially lined and sealed cardboard containers such as those containing potato chips, cookies, tortillas, crackers, nuts, fruits, and many meat products. The presence of oxygen above a predetermined level (typically 2-3% O_2) indicates air contamination and a potential packaging problem. The analyzer, called the Series 340, may be used with an optional food bag sampling adapter for easier measurements. To use, the operator grasps the adapter in one hand, inserts the needle in the food package, withdraws a sample by pulling the plunger on the syringe, and then reads the analyzer meter to determine the oxygen concentration. The sensor is specific for the measurement of oxygen and is unaffected by nitrogen, argon, and other typical packaging gases. No zero gases are needed for calibration.
(Food Technology 37(12); 1983; 67)

62 Isostatic gas permeability tester

This model GPM-200 permits the simultaneous determination of permeability of films, foils, and containers to CO_2, O_2 and N_2 with or without water vapour present. Gas exchange of the containers can be measured in the containers' filled state, and degradation processes such as fermentation can be documented. The measuring method is reportedly more sensitive and of wider range than manometry, and is also faster and more reproducible because human error is eliminated.



(Food Technology 38(1); 1984; 132)

63 In-line diluter

MEMCO offer a range of in-line diluters for the dilution of acids (hydrochloric, nitric, phosphoric or sulphuric), alkalis (caustic soda or potash) and many other corrosive and dangerous chemicals. For the dilution of sugar syrup, fruit juices, soft drink concentrates, molasses, citric acid, acetic acid, ammonium sulphate, urea or phosphates, hygienic designs with modern mixing concepts are offered. The diluter comes in sizes ranging from 20 to 1,000 litres/hour. Materials of construction are: lead lined/bonded with polypropylene entries for sulphuric acid; PVC, PVC/teflon coated for hydrochloric acid; SS 316/304 with sanitary finish for some chemicals and food-fermentation; and MS non-corrosive chemicals.

(PENDAI Newsletter No.45; 1983; 1)

64 Avocado ripeness determination

At University of California-Riverside, food engineers are using the microwave oven to help determine avocado ripeness. While avocados traditioally are picked green, if they have not reached a minimum degree of ripeness they lack adequate oil content to continue to ripen. To determine when to pick, the UC researchers dry sample fruit rapidly in a microwave oven. The dry weight then is used to determine oil content.

(Agricultural Engineering 64(1); 1983; 5)

65 Can vacuum checker

A non-contacting displacement transducer (multi NCDT) system, which senses the surface-form of the lid whilst canned goods are moving on a conveyor belt, is now available from Bristol Industrial and Research Associates Ltd. of PO Box 2, 6 Combe Road, Portishead, Bristol.

The Micro-Epsilon system uses special electronic circuitry to store three displacement values and to calculate the deflection of the lid. As the lid acts like a diaphragm, the vacuum inside the can is directly proportional to the deflection. It is electronically controlled with an adjustable set point that will reject cans showing a suspect vacuum.

The system is very rapid in operation and more than 20 items can be tested in one second.

(Food Trade Review 53(6); 1983; 321)

66 Unique toxicity instrument

Beckman Instruments advise of the availability of the Microtox™ Model 2055 Toxicity Analyser System, the first commercially available instrument for monitoring acute toxicity in various types of environment samples. It is claimed to be the first instrument to utilise luminescent bacteria for determining water toxicity. Results from Microtox testing compare favourably with the results of current bio-assays based upon the response of fish and other aquatic life forms to a wide variety of toxicants. A built-in calibration system verifies proper instrument function. Freeze dried bacteria, carefully processed and controlled to prevent biological variation, can be checked against standards and controls.

(Food Technology in Austria 35(11); 1983; 490)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

67 All India final estimate of potato, 1982-83

STATE	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	0.3	0.9
Assam	43.3	250.2
Bihar	132.6	1237.9
Gujarat	11.4	288.9
Haryana	9.1	136.5
Himachal Pradesh	13.6	35.5
Jammu & Kashmir	1.7	3.1
Karnataka	11.9	87.5
Madhya Pradesh	28.2	279.5
Maharashtra	11.6	59.3
Manipur*	2.0	10.5
Meghalaya	17.8	142.2
Nagaland	5.8	40.6
Orissa*	9.5	66.4
Punjab	27.8	524.2(E)
Rajasthan	1.5	2.5
Sikkim	2.9	11.1
Tamil Nadu	12.1	77.9
Tripura	2.6	34.2
Uttar Pradesh	286.1	4485.9
West Bengal	115.9	2319.7
Arunachal Pradesh*	1.5	10.8
Delhi	Neg.	0.2
Mizoram**	0.6	2.8
All India	749.8	10108.1

* - Data relate to 1981-82
E - Estimated
** - Data relate to 1980-81
Neg- Negligible.

(Directorate of Economics & Statistics, Ministry of Agriculture, Government of India, New Delhi)

68 All India final estimate of sweet potato, 1982-83

STATE	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	3.4	17.0
Assam	9.5	31.5
Bihar	63.1	420.0
Gujarat*	1.2	21.5
Haryana	0.8	18.6
Karnataka	7.4	46.6
Kerala	5.3	35.1
Madhya Pradesh	9.3	54.2
Maharashtra	5.6	78.4
Manipur**	Neg.	0.1
Meghalaya	4.5	13.5
Nagaland	0.3	0.8
Orissa	53.2	398.4
Punjab**	0.2	0.2
Rajasthan	2.1	3.1
Tamil Nadu	2.0	19.7
Tripura	1.5	14.9
Uttar Pradesh	44.3	381.5
Andaman & Nicobar Islands	0.1	0.7
Arunachal Pradesh**	0.3	1.1
Delhi**	Neg.	0.2
Mizoram*	0.6	2.1
Pondicherry	0.1	0.9
ALL INDIA	214.8	1560.1

* - Relate to 1980-81
** - Relate to 1981-82
Neg- Negligible

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

69 All India final estimate of banana, 1982-83

STATE	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	20.2	344.5
Assam	25.5	353.3
Bihar	9.4	49.0
Gujarat **	20.9	666.7
Karnataka	18.8	103.7
Kerala	49.3	293.8
Madhya Pradesh	11.1	266.2

contd.

Contd.

STATE	Area (Thousand hectares	Production (Thousand tonnes)
Maharashtra	48.3	1207.5
Manipur**	2.0	25.7
Meghalaya	3.3	41.7
Orissa*	17.9	155.8
Tamil Nadu	37.1	648.0
Tripura**	3.2	17.8
Uttar Pradesh	0.8	10.7
Andaman & Nicobar Islands**	1.2	5.6
Arunachal Pradesh	0.5	1.3
Mizoram*	1.4	1.3
Pondicherry	0.2	2.6
Lakshadweep**	0.1	1.8
ALL INDIA	271.2	4195.0

* - Relate to 1980-81
** - Relate to 1981-82

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

70 Trend in production of tomato products

Quantity: Tonnes

Year	Quantity
1978	2915
1979	3587
1980	5629

(Profodcil Bulletin 17(2); 1982; 3-11)

71 All India final estimate of coconut, 1982-83

STATE	Area (Thousand hectares)	Production (Million nuts)
Andhra Pradesh	44.6	178.8
Assam	6.5	45.9
Karnataka	178.9	930.1
Kerala	658.5	2444.3

contd.

Contd.

STATE	Area (Thousand hectares)	Production (million nuts)
Maharashtra**	10.2	61.1
Orissa*	22.5	98.8
Tamil Nadu	143.0	1650.0
Tripura**	1.4	1.7
West Bengal**	3.3	29.4
Andaman & Nicobar Islands**	21.3	87,0
Goa, Daman & Diu	18.7	100.0
Lakshadweep**	2.8	21.7
Pondicherry	1.6	15.5
ALL INDIA	1113.3	5664.3

** - Relate to 1981-82
* - Relate to 1980-81

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

72 All India final estimate of onion 1982-83

STATE	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	16.3	145.5
Assam	2.1	4.7
Bihar*	14.4	98.0
Gujarat*	13.1	339.4
Haryana*	1.1	13.5
Himachal Pradesh	0.7	0.9
Jammu & Kashmir*	0.5	3.7
Karnataka	35.0	218.4
Kerala	0.4	2.7
Madhya Pradesh	12.6	157.2
Maharashtra	55.0	745.6
Nagaland	0.1	0.4
Orissa	29.4	201.3
Punjab*	0.9	12.3
Rajasthan	10.1	37.4
Tamil Nadu	22.3	186.0
Tripura*	0.1	0.2
Uttar Pradesh*	21.9	361.8
Delhi	0.1	0.5
Pondicherry	**	0.1
ALL INDIA	236.1	2529.6

* - Data relate to 1981-82 ** - Less than 50 hectares.
(Directorage of Economics and Statistics, Ministry of Agriculture, Govern-

73 All India final estimate of arecanut, 1982-83

(Thousand tonnes)

STATE	Production of arecanut-dried nuts without husk (Processed Nuts)	
	Tender	Ripe
Andhra Pradesh	-	0.2
Assam**	3.9	44.2
Karnataka	8.9	72.6
Kerala	3.1	37.6
Maharashtra**	-	2.4
Meghalaya*	0.5	4.4
Tamil Nadu	-	3.6
Tripura**	-	1.0
West Bengal	0.2	0.6
Goa, Daman & Diu**	-	1.3
Mizoram*	-	Neg.
ALL INDIA	16.6	167.9

* - Relate to 1980-81
** - Relate to 1981-82
Neg- Negligible

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

74 All India final estimate of arecanut, 1982-83

STATE	Area (Thousand hectares)	Production (Thousand tonnes) dried nuts without husk (Processed nuts)
Andhra Pradesh	0.2	0.2
Assam**	47.2	48.1
Karnataka	56.0	81.5
Kerala	58.1	40.7
Maharashtra**	2.1	2.4
Meghayala*	6.5	4.9
Tamil Nadu	4.6	3.6
Tripura**	0.7	1.0
West Bengal	3.1	0.8
Goa, Daman &Diu**	1.3	1.3
Mizoram*	0.4	Neg
ALL INDIA	180.2	184.5

** - Relate to 1981-82 * - Relate to 1980-81
Neg. - Negligible

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi)

PRODUCTION (INDUSTRIAL)

75 Sugar production

The total output of sugar during the first five months of the season 1983-84 is 40,56,000 tonnes as against 46,70,000 tonnes during the corresponding period last year. The total closing stock of sugar with the factories as on 29.2.84 was about 50,87,000 tonnes as against 50,77,000 tonnes on the same date last year.

(*Indian Sugar Mills Association - press release*)

76 Trend in alcohol and molasses output

	Molasses (Million tonnes)	Alcohol (Million litres)
1979-80	1.58	385.9
	(-38.3)	(-11.9)
1980-81*	2.19	430.7
	(38.6)	(11.6)
1981-82*	3.99	515.4
	(82.2)	(19.7)
1982-83(E)	3.59	576.2
	(-10.0)	(11.8)

* - Provisional; (E) - Estimated anticipated

(*Economic Times January 11, 1984, 8*)

77 Distillation capacity in different states

(as in September 1982)

STATES	Number of distilleries	Annual installed capacity (kilo litres)
Andhra Pradesh	19	71,882
	(13.5)	(7.9)
Bihar	8	43,760
	(5.7)	(4.8)
Gujarat	6	36,300
	(4.3)	(4.0)
Karnataka	15	85,235
	(10.6)	(9.4)
Madhya Pradesh	6	11,710
	(4.3)	(1.3)
Maharashtra	27	208,079
	(19.1)	(22.9)

contd.

Contd.

STATES	Number of distilleries	Annual installed capacity (kilo litres)
Tamil Nadu	8 (5.7)	72,950 (8.0)
Uttar Pradesh	25 (17.7)	308,256 (34.0)
Other States	27 (19.1)	69,834 (7.7)
TOTAL	141 (100.0)	908.006 (100.0)

Figures in bracket are percentages to total.

(Economic Times January 11, 1984; 8)

8 Production of technical grade pesticides (1982-83)

Name	Qty. (Tonnes)
Insecticides	
1. BHC	32378
2. DDT	5199
3. Malathion	4027
4. Parathion	3030
5. Metasystox	188
6. Fenitrothion	154
7. Fenthion	151
8. Dimethoate@	896*
9. Phosphamidon	852
10. DDVP	174
11. Quinalphos	605
12. Ethion	9
13. Carbaryl	2337
14. Monocrotophos	318
15. Lindane	-
16. Endosulphan	2098
17. Thimet (Phorate)	506
Thiocarbamates	
18. Thiram/Ziram/Vapam/Ferbam	13
19. Dithane	1539
20. Organomercurials@@	147
21. Carbendazim (Bavistin)	65

contd.

Contd.

Name	Qty. (Tonnes)
Rodenticides	
22. Ratafin	4
23. Zinc Phosphide	302
Fumigants	
24. Aluminium Phosphide	616
25. Methyl Bromide	30
26. Ethylene Dibromide	56

@ - DGTD Registered Units
@@ - Production in terms of 15% and 10%
* - Provisional

(*Pesticide Information 9(2); 1983; 32-33*)

EXPORT

79 Tomato products - exports from India

Quantity:Kilograms
Value : Rupees

Year	Quantity	Value
1978-79	22820	169631
1979-80	16530	163836
1980-81	43234	291568

Source : DGCIS, Calcutta

(*PROFODCIL Bulletin 17(2); 1982; 3-11*)

IMPORT

80 The distribution of imported oil

(lakh tonnes)

	Vanaspati industry	Public distribution system
1980-81	6.41	4.15
1981-82	5.73	4.34
1982-83	6.00	5.36

(*Economic Times February 22, 1984; 6*)

TRADE INFORMATION

81 Overseas offices for exporters

Indian exporters would be able to open foreign offices or post representatives abroad to facilitate their export efforts. This concession to the exporters has emanated from recommendations of the interim report of the Patwardhan committee set up by the Reserve Bank on exports and imports. As such, two initial permits would be issued to exporters in commodity, construction and consultancy areas for 18 months with the facility to draw exchange for recurring expenses at monthly quarter intervals. The second concession recommended by the committee and accpeted by the Reserve Bank was that while issuing a permit for the opening of trading branch, the exporter might also be advised alongwith other conditions to be stipulated by RBI, that it was prepared to consider the release of foreign exchange for office maintenance upto three years or for a period by which the foreign branch became self-supporting.

(Kassia Bulletin 23(11&12); 1983; 15)

82 Disseminating information on standards to exporters

National Enquiry Point under the Agreement on Technical Barriers to Trade as part of General Agreement on Tariffs and Trade (GATT) has been set up in Indian Standards Institution (ISI) by the Union Ministry of Commerce. The Enquiry Point will identify and provide information on the existence, status, scope, applicability and availability of Indian, International and Overseas Standards for exports. Further, it will help interested parties in India to get advance information and give them an opportunity to comment on proposed foreign standards and technical regulations, so as to ensure that the exports are not affected by differences in the technical regulations of the various countries.

The agreement aims to ensure that Governments and other bodies adopting technical regulations, standards or certification systems should not create unnecessary obstacles to trade. The Enquiry Point ensembles complete sets of Indian International and Overseas Standards. It is felt that it will prove helpful to Indian exporters seeking information on proposed and adopted standards, technical regulations and certification systems in the concerned country for the export of their products.

(Economic and Commercial News 13(52); 1983; 8)

83 Ethiopia - Commercial Bank

The Commercial Bank of Ethiopia has stopped corresponding with Indian banks complaining of non co-operation on their part. As a result Indian suppliers are now required to issue bid bonds, performance guarantee, etc. through foreign banks based in India or have counter guarantees issued by these banks.

(Spices Newsletter 17(12); 1983; 6)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

84 GRAS status to some more substances

FDA has approved that the following substances are GRAS.

Substance	Details in Federal Register of:
Carnauba wax	Nov.7
Riboflavin and riboflavin-5''-phosphate (sodium)	Nov.7
Pectins	Nov.7
Lecithin	Nov.7
Rennet	Nov.7
Malt syrup (malt extract)	Nov.10
Potassium chloride	Nov.10
Pyridoxine hydrochloride	Nov.10
Urea	Nov.10
Cande wax	Nov.10
Nickel	Nov.10
Starter distillate and diacetyl	Nov.15
Calcium pantothenate (FDA is also removing sodium pantothenate and D-pantothenyl alcohol from the GRAS list because of lack of food use information)	Nov.15
Dextrin	Nov.15
Vitamin A (including vitamin A acetate and palmitate)	Nov.15
Maltodextrin	Nov.15
Niacin and niacinamide	Nov.16 & Dec.2
Tartaric acid potassium acid tartrate, sodium tartrate, and sodium potassium tartrate	Nov.18
Sodium alginate (at up to 2% in processed fruits and fruit juices)	Nov.18

(Food Technology 38(1); 1984; 38)

Sucrose cleared by FDA

FDA has cleared sucrose for use as emulsifiers and stabilizers in food applications. The material is made up of monoesters, diesters, and triesters of sucrose, with fatty acids derived from edible tallow and hydrogenated edible tallow. The process for making the sucrose esters is owned by the State of Nebraska, and approval from the FDA was received by the Nebraska Department of Economic Development. The esters are currently being produced by Nebraska's licensee in Japan, Dai Lchi Kogyo Seiyaku, Ltd. Approval was given for use as emulsifiers and stabilizers, in baked goods, dairy product analogs, frozen dairy desserts, whipped milk products, biscuit mixes, and as protective coatings applied to fruits to retard ripening and spoilage.
(Cereal Foods World 28(12); 1983; 745)

Non sugar sweeteners approved

Non sugar sweeteners continue their growth. The United Kingdom recently approved the use of six sweeteners; aspartame, acesulfame-K, hydrogenated glucose syrup, isomaltose, xylitol, and talin (Tate & Lyle's tradename for thaumatin).
(Cereal Foods World 28(12); 1983; 743)

Egg bread standards

The FDA Commissioner has issued a final decision following a formal evidentiary public hearing concerning amendments to the standards of identity for bakery products. The final decision allows the use of lecithin, hydroxylated lecithin, and related phosphatides as optional ingredients in egg bread and related products; allows the use of spices, spice oil, spice extract, and artificial colouring as optional ingredients in standardized bakery products; and requires a minimum of 2.5% by weight of whole egg solids (equivalent to one medium-sized egg per 1-lb loaf) to justify use of the name "egg bread", etc. Details are in the Federal Register of Nov. 9.
(Food Technology 38(1); 1984; 38)

Potassium chloride in canned tomatoes

The Food and Drug Administration has okayed the use of potassium chloride as a substitute for sodium chloride in canned tomatoes without violat-

ing the standard of identity.

The reply from FDA stated that: "Whenever a potassium salt is used as a partial substitute for sodium chloride in a standardized food which permits such addition and such substitution does not change the basic nature of the food, the use of potassium salt need only be reflected in the ingredient statement".

"With respect to canned tomatoes, the list of permitted optional ingredients provides for salt, flavourings and seasonings, among other things, the term 'seasonings' allows for the addition of potassium chloride in lieu of salt. We assume that the users would want to make a claim such as 'no salt added'. In that case the sodium information must be given as required by 21 CFR 105.69".
(Food Production Management 105(6); 1983; 68)

89 Irradiation treatment of spices

The FDA has amended Food Additive Order 179.22, to allow gamma radiation to reduce or control microbial contamination in specified spices, natural flavourings, and dehydrated vegetable seasonings. According to a report from the Bureau of Foods Irradiated Foods Committee, the type of radiolytic products from individual spices and their concentrations in the diet would be so low that it would be of no safety concern. This method of sterilization could replace treatment of spices with ethylene oxide, a mode of decontamination that has come under attack from some groups, because of possible health hazards from residual ethylene oxide.
(Cereal Foods World 29(1); 1984; 43)

90 Use of EDB suspended

EDB has been suspended as a pesticide for grain and grain milling equipment. The EPA ruled in September that ethylene dibromide should no longer be used. Several milling companies had already been studying alternatives to EDB, and others have not used the chemical for years, using instead methyl bromide, phosphine gas, and newer housekeeping measures.
(Cereal Foods World 28(12); 1983; 745)

HYGIENE

91 New food industry grease

A new white food industry grease is now available in New Zealand. This grease will withstand washing-out from water, steam, food or fruit juices,

withstanding temperatures from -10 F + 295 F, which covers most food processing needs. This is described as the finest quality white grease fortified with micron size teflon particles, in contrast to most greases of this type, which contain metallic lithium.

Teflon widens the scope of lubricants as it is one of the most slippery substances known, providing better lubricity and less machine wear. This colourless grease avoids black markings, where stains render products reject material. Pure mineral oil grease with Teflon added carries the MAF approval as well as FDA regulation 178.3570-177.1550 as a superior quality, multi-purpose grease for food and beverage plants.
(Food Technology in New Zealand 18(7); 1983; 47)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

92 CSIR complex for Himachal Pradesh

The Council of Scientific and Industrial Research is to build a 200 acre complex at Palampur in Himachal Pradesh to cater to the industrial needs of the state. The new complex would render all assistances to improve the economy of the state by encouraging the people to adopt a scientific outlook. Biotechnology is to be the main field of research in the new CSIR complex.
(Chemical Age of India 34(12); 1983; 781)

93 International cooperation on soy milk

The Alfa-Laval AB of Sweden and the Kibun Company Limited of Japan have entered into a cooperation agreement for the production of soy milk-based drinks and beverages. The Alfa-Laval will contribute its century-old experience in the design and manufacture of plant and continuous processing systems while the Kibun will supply in-depth knowledge of product technology. The cooperation is expected to bring about a total know-how and equipment package in the rapidly expanding field of soy milk products. Initially, the companies will concentrate on the Asian and African markets before going into the world market.
(Asia-Pacific Technology News July-Sept. 1983; 10)

94 Technology for the utilization of distillery effluent as food

A technology developed by Solar Aquafarms Inc. of the U.S. capable of converting the distillery effluent into food for raising fast growing species of shrimp and fish, has been transferred to a Madras firm Vorion Chemicals and Distilleries Ltd. The effluent from India's 146 ethanol distilleries need not be an environmental hazard that they have been till now, once this technology is utilised and the biologically rich organic material from the distilleries is converted into a nutritious food for raising shrimp and fish utilising brackish water on uncultivable lands. The Madras firm is establishing an effluent treatment aqua-culture project, 40 hectares in extent, costing Rs. 6 crores, at its distillery in the Chingleput district. According to the company, it will transfer this technology to other distilleries in India also.

(Hindu February 12, 1984; 6)

PERSONALIA

Nil

RAW MATERIALS

95 Engineering a new tomato

In America the H.J. Heinz Co are endeavouring to develop a new tomato in conjunction with Arco Solar, a subsidiary of Atlantic Richfield, a large oil corporation. The aim is to cultivate what is described as 'heartier, heavier, faster maturing tomatoes' The new tomato has been christened the Super Tomato and the development will be a result of genetic engineering which is quite unlike the traditional cross breeding. Heinz own seeds, Arco biologists hope to produce a tomato with about twice the solids contents of the existing tomato - a move from 5 per cent to 10 percent solids. *(Food Trade Review 53(3); 1983;128)*

96 Mushroom Cultivation

A cheap and simple method for cultivating pleurta, a mushroom popularly known as Dhingri, has been developed by scientists at the Centre for Rural Development and Appropriate Technology at the Indian Institute of Technology, Delhi. The new method can enable a farmer to earn more than Rs. 800 in three months, by producing 100 Kgs of mushrooms with an initial investment of Rs. 140. It is cheaper than the most commonly grown button mushroom which also requires extensive care, specific temperature conditions, according to Dr (Ms) Mira Madan.

Dhingri can be grown in polythene bags having holes for aeration. Dry paddy straw is chopped into small pieces of about 4-5 cm. The straw should be dipped in hot water for more than one hour and transferred in cold water for 12 hrs. The wet straw is mixed with 8% spawn and 2% wheat or bran or with one percent tur or gram dal powder.

White mycelium spreads on the substrate and it becomes a round mass of compact straw after about 15 days. The polythene sheets are then removed and straw blocks are kept in room with good aeration and humidity built up by sprinkling water on floor and walls two times a day. After 5-7 days, young mushrooms start appearing on all sides of the straw block, attaining normal size in 2-3 days. The second crop appears in 7 - 10 days. Three or four crops grow within a period of 4-5 weeks and then the straw block, exhausted of food for producing mushrooms, can be directly used as organic

manure without any further decomposition. The exhausted straw block has the same fertiliser value as the farmyard manure.

Mushroom cultivation is gaining popularity in India because of its varied climatic conditions in different parts of the country in different seasons. This helps to a great extent cultivation of different types of mushrooms without artifical temperature and humidity control. There is a large availability of post harvest agriculture materials like straw drie leaves, waste from food industries, etc. Most of the materials remain unus except to a limited amount when used as a cattle feed. These agrowastes can be easily transformed into biomass by treating them with fungi, thereby producing valuable nutritionally acceptable food like mushroom. The mushroom because of its palatibility and direct utilisation supersedes all unconventional foods like yeast, bacteria, algae and green leaves.
(PTI Science Service 3(6); 1984; 7-8)

97 Mushrooms without soil

Mushroom cultivation or spawn culture can give good returns. By spending rupees five one can earn Rs.220 within 21 days. A bottle of decayed jowar costing Rs.3 is acquired from the Indian Institute of Horticulture or the Agricultural University. It takes less than a week for the germs to multiply. They are then transferred to six layers of straw sterilised a kept damp. A handfull of rice or wheat bran is strewn over the layers. It is kept in shade for about 20 days. Then the layers are taken out and the lumps are removed. Twice a day, water is sprinkled and mushrooms appear on them. At least 6 Kg of oyster variety of mushroom can be obtained from bottle of decayed jowar.
(Cardamom 17(3); 1984; 16-17)

98 Exotic rabbits as edible meat

An ambitious and novel project to popularise exotic rabbits as sources of meat for human consumption was undertaken by the College of Veterinary Sciences of Andhra Pradesh Agricultural University.

Experiments carried out at the college had shown that a healthy two- and a half-month old rabbit can yield 2.5 Kgs of meat with high protein content.

Due to efforts of the college, the exotic rabbits are easily available and their meat content has been doubled. This would help in meeting to a certain extent the protein deficiency in the population in the country.

Rabbit meat is considered to be delicious and nutritious with no religious taboo attached and is equivalent to poultry or sheep meat. Its fur finds several uses like making beautiful handbags, gloves and coats, he added.

More than 10 per cent of India's population were basically meat eaters. Poultry and sheep are the general sources of protein rich meat. In view of their shortage and rise in their prices meat obtained from rabbits could go a long way to ease the supply position.

It had also been estimated that the percapita intake of protein was less than ten per cent of the total requirement per day. Even this could be increased through this additional sources of rabbit meat.

It has been shown that 2.5 Kgs of feed prepared from wastes of several fibrous material and green grasses fed to the exotic rabbit yield within a span of twelve weeks a total of one kg of meat.

The only problem involved in rabbit rearing that one comes across is their susceptibility to coccidiosis (a disease with symptoms of blood tinged diarrhoea). They can be effectively controlled using drugs and better care. *(PTI Science Service 2(23); 1983; 12-13)*

99 A novel fatty acid in yeast lipid

Scientists have for long been investigating a new strain of yeast which is also capable of producing oil. One such strain of yeast is Rhodotorula glutinis, which occurs in soil.Studies with the new strain grown in molasses show that this contain palmitic acid, stearic acid, oleic acid, linoleic acid and linolenic acid. Scientists of the Bose Institute, Calcutta also revealed that the new strain of the yeast contains unusual fatty acids with hydroxy, eto and epoxy functions. They have reported presence of 3-methoxyoctadecenoic acid in the yeast lipid and that this occurs only in the glycolopid fraction. The lipid was extracted from the dry cells by means of solvents. The lipid obtained in this was then saponified by means of alcoholic caustic potash. The non-saponifiable fraction was then removed by ether and the alkaline solution was acidified to afford fatty acids. These are purified via esters. Analytical and preparative gas chromatography were performed to identify

these. Although there is evidence that some yeasts and yeast-like fungi can produce extra-cellular hydroxy, acetylated and partically acetylated fatty acids, previously presence of 3-methoxyoctadecenoic acid could not identified. Scientists of the Bose Institute subjected total lipid fractionation by column chromatography on silicic acid. The isolated neutral, glyco and phospholipids by diluting these with chloroform, acetone and methyl alcohol respectively. The glycolipid fraction on sapon ification showed presence of a novel fatty acid, 3-methoxyoctadecenoic acid in addition to palmitic acid, oleic acid, stearic acid, linoleic acid and linolenic acid.

(PTI Science Service 2(23); 1984; 8-9)

STORAGE AND INFESTATION CONTROL

100 Storage of fruits

Scientists at the East Malling Research Station in Kent, South-East England, are developing a new and better way of keeping apples which might well be applied to storing many other fruits and vegetables for long periods with negligible deterioration.

The problem is that certain fruits and vegetables are difficult to store because they produce ethylene (C_2H_4). Ethylene triggers the ripening process which in turn stimulates the synthesis of more ethylene, and so on until the ripening process runs out of control. It is natural in many kinds of fruit, a sign of senescence with the breakdown of cell walls, for example which softens the produce. It is not, as is often assumed, caused through infection by fungi or bacteria.

According to Dr Michael Knee, a biochemist at the station, unripe apples contain only 0.01 ppm (parts per million) of ethylene and produce 0.01 millilitres/tonne of apples per hour, but for ripe apples the figures are multiplied 5000-fold. And ethylene in the store atmosphere should be to below 1 ppm, because above this level it will initiate ripening, so there is a constant problem with traditional storage methods where ethylene accumulates to between 100 and 1000 ppm.

So far, there is no way of blocking ethylene synthesis chemically by spraying fruit before picking it or when it is stored. Two families of amino acids are known to inhibit the synthesis of ethylene, but neither are acceptable because of their toxicity.

The traditional way of storing apples is to keep them in a low temperature and in a controlled atmosphere containing less oxygen and a much higher proportion of carbon dioxide than in air. In such conditions, less ethylene is produced. When apples are stored in air, with its 21 per cent oxygen, it is not possible to prevent ethylene accumulating.

The new storage technique developed by Knee and Colin Dover, a physicist at East Malling, delays the onset of ripening by continuously removing ethylene from the atmosphere in which fruit is stored. After preliminary trials they designed an ethylene removal system (an ethylene 'scrubber') for use with the station's 20-tonne stores; they first used it for the 1981/82 storage season, when they kept the cooking apple Bramley's Seedlings for almost 11 months. The apples remained in good condition, and Knee and Dover brought the trial to an end only because the apples had to be sold; they wanted to use their storage space. Later this year, however, they hope to test their ethylene removal system with commercial apple stores of 100 tonnes capacity.
(Spectrum No. 186; 1984; 11-12)

101 Cooling fans for apples

Energy used in cold-storage rooms housing Red and Golden Delicious apples could be cut nearly in half using a new fan-cycling scheme devised by an agricultural engineer. Keeping cooling fans in apple cold-storage rooms on for 6 hrs then switching them off for 6 hr twice during a 24 hr period- maintains safe Red and Golden Delicious fruit temperatures. The practice uses only 52 to 60 per cent of the energy expended when fans are operated continuously for 24 hr according to agricultural engineer Gilbert Yost, Wenatchee, Washington. According to Yost, there is no difference in the quality of apples stored under either a cycled or a noncycled fan: average fruit temperatures are held at 31° to 32°F under both systems, reports Agricultural Research.

Most cold-storage facilities use air temperature readings to maintain fruit temperatures, which doesn't give a true picture, fruit temperatures should also be monitored, he says. At harvest time, fans must run

continuously until the field heat is removed from the fruit and proper storage temperature is attained. At this point, Yost says, fan cycling can begin. He suggests that storage-facility owners time their fan-cycling operations to fit the peak-load hours of their local utility companies (when rates could be cheaper)

This adjustment won't interfere with the maintenance of optimum temperature he says. Though tested only on red and Golden Delicious apples. Yost feels his technique should work for other apple varieties as well, but further research is needed.

(PTI Science Service 3(4); 1984; 17)

102 Solar refrigerator

The Energy Technology Division of the Asian Institute of Technology, Bangkok, has developed a village-size solar refrigerator with a collecting area of about 25 sq.m. (12 collectors with a collecting area of approximately 2 sq.m. each) which provides 0.5 cubic metre of food storage space below $10^{o}C$ or makes 100 Kg, of ice per day under favourable conditions. The system requires no electrical mechanical energy and can be manufactured locally. The system is ideal for village use as storage for agricultural pro or as ice-making machine.

(PTI Science Service 3(6); 1984; 16-17)

FOOD ADDITIVES

10[illegible] Tomato extender

The General Spice Inc of 238 St Nicholas Avenue, South Plainfield, NJ 07080, USA have given us brief details of their new tomato extender. The cold water soluble variety has been designed to replace up to 33 per cent of tomato paste or puree in the manufacture of products incorporating this material. Mere mixing with water till the required texture has been achieved is how the product is handled. Their second product is a heat process tomato extender where mixing with hot water is necessary. We are told that these extenders help to stabilise fats and keep them from separating in sauces.

(Food Trade Review [illegible] (3) 1984,

PROCESSES

Higher recovery from oilseeds

Higher recovery from oilseeds and better energy efficiency are possible with a wet-grinding process being developed by EPE Inc. Strongsville, Ohio. In a demonstration, the process left only about 5% residual oil in copra, compared to an average of about 8-18% for conventional routes. Typically, oilseeds or other oil bearing biomass are broken into 0.25-in. pieces in a hammermill, then are treated in flaking rolls and a dryer to reduce moisture from about 6% to 2%. The final step is filter pressing to recover oil. An alternative is to prepress the seeds to remove about half the oil, mill, and solvent-extract the remaining oil. The process starts with a hammermill, then substitutes wet grinding, using the seed's oil and finally drying and centrifuging to separate the solids from the slurry. At this point, about 35 per cent of the oil is still in the solids. Filter pressing recovers all but 5%. The process was piloted last year in a 100-metric-ton/d plant being run at 1 m.t/h (about 25% capacity) in the Philippines, using copra.

(PTI Science Service 3(12); 1984; 15)

Papain and papain concentrate

The Regional Research Laboratory, Hyderabad has developed the process for producing papain and papain concentrate. The process is simple and involves no complicated plant and machinery. The yield of the crystalline papain and papain concentrate based on the crude latex amounts to 0.3-0.5 per cent respectively. The main raw material needed in the process is latex obtained by making a series of longitudinal cuts in the skin of the mature but green fruit while it hangs on the tree. In a few minutes the latex ceases to flow from the cuts. The operation can be repeated at daily intervals for a week or more. The other raw materials needed are cysteins hydrochloride, sodium hydroxide, ammonium sulphate, sodium chloride, ethyl alcohol and lactose. The total capital outlay for putting up a plant of 500 gm of crystalline papain and 500 kg of papain concentrate per year has been estimated at Rs. 0.5million. The cost of production of crystalline papain and papain concentrate has been worked out at Rs. 236

per gram and Rs. 324 per Kg. Crystalline papain is not known to be produced in the country. Its demand has also not been assessed. Apart from its indigenous requirements there is a good scope for exports to USA and European countries. Presently Ceylon is the leading supplier of Papain in the world Western countries are now importing the purified papaya latex for further processing.
(Economic and Commercial News 14(14); 1984;14)

106 Deacidification of rice bran

One of the difficulties in using rice bran oil for edible purposes is its high free fatty acid content. It is due to these acids rice bran oil becomes highly rancid and is unfit for use. Among other difficulties removal of free fatty acids (FFA) is one. Recent investigations have revealed that alcohol can effectively lower acid content in rice bran oil. Among all solvents, alcohol is chosen as a solvent for extraction of acids since fatty acids are appreciably soluble in alcohol.

Alcohol has many advantages; first it can bring down level of free acids to an extent much better than other solvents. Secondly, it is superior to the conventional methods since extraction of free fatty acids can be done both at room temperature only by stirring or by refluxing. Thirdly, loss of oil during refining by extraction is comparatively poor and alcohol recovered can be reused. Studies made at Calcutta have indicated that the refined oil on further refining by alkali treatment may be used for making vanaspati.

Recent work carried out at the University College of Science Calcutta revealed that the efficiency of extracting free fatty acids by alcohol depends on volume of alcohol used and that too on mixing time, extraction temperature and also on whether or not extraction is made in a single stage or a two stage process. They reported that volume of alcohol has an important role since more and more fatty acids can be extracted by increasing alcohol proportion. When oil alcohol ratio changes from 1:1 to 1:2 and 1:3 extraction of free fatty acids also differs markedly. For the mixing time extraction temperature is 30°c, FFA content in the oil after extraction becomes 1.8, 9.2 and 7.2 per cent respectively for the above oil-alcohol ratio. It is further revealed that much more FFA can be

extracted if mixing time is raised. Work revealed that 80 per cent of fatty acids can be extracted by two stage extraction each with three volumes of alcohol at 30 degree centigrade. Since solubilities of fatty acids in alcohol are also greatly influenced by the presence of other constituents like wax etc, one condition for deacidifying rice bran oil is that rice bran oil used should be a dewaxed specimen.
(PTI Science Service 3(4); 1984; 12)

107 How to tenderize meat?

How can one guarantee a tender and hygienic meat for consumers, and at the same time facilitate the work of the meat professionals? The answer is provided by a procedure suggested by Thadeus Staron, a research worker at the INRA, Paris ("Nutritional Encyclopaedia of Man", INRA, 1983, p.423). It consists in an instantaneous transformation of the muscles in meat by intravenous injection of ammonium salts into the animals just before slaughter. Generally, the muscles harden after slaughter (onset of rigor mortis). Now ammonium salts are noted for their ability to make the muscle fibres more fragile, thereby supressing rigor mortis and permitting an instantaneous maturation of the meat. This phenomenon permits hot de-boning of carcasses - twice as rapid as cold deboning - a conditioning and an immediate freezing, and makes storage easier because of the reduced volume of the deboned carcasses. The ultimate advantages are that the meat can be consumed very rapidly; the risks of bacterial contamination are considerably reduced, resulting in an optimal hygienic quality.

T.Staron says that the ammonium salts are physiological compounds and the doses correspond to about half of the ammonia liberated by a carcass that has been stored for 6 days at $+4^{o}C$ further, ammonia is the principal agent in the maturation of meats (the tenderness of non-eviscerated wild game is due, moreover, to the diffusion of visceral ammonia).
(La Recherche, 15(153); 1984; p.364)

108 Debittering of fish protein

Scientists have developed a process to remove bitter materials from fish protein hydrolysates with the help of ethyl alcohol.

Fish protein hydrolysates have a great value as human food but

investigations have shown that the hydrolysates obtained by the use of enzyme like papain and bromelin are bitter in taste. Therefore, they have limited value as food materials. For a long time, studies are being carried out to remove the bitter materials from the hydrolysates so that these can be potentially used as edible materials. Scientists in Kakinada have found that using ethyl alcohol for debittering was a simpler method.

The process consists of digesting vacuum dried hydrolysates in water followed by treating the same with alcohol at ambient temperature (30°C) and leaving overnight when it separated into two fractions; the precipitate and a supernatant liquid. The supernatant liquid contained th bitter material. These investigations further reported that alcohol addition causes precipitation of low molecualr weight peptides (mol. wt less than 300). The debittered fraction, therefore, is free from these peptides. The debittered fraction, consequently, contains less of a alpha-amino nitrogen content since peptides responsible for increase in alpha amino nitrogen content are already removed by alcohol treatment. On the other hand, the debittered fraction contains more proteoses than that of their counterparts. It was further revealed that the more the alcohol used, the more is the debittering. Increase of alcohol concentration also increases yield of debittered fraction.
(PTI Science Service 3(3); 1984; 6)

109 Pakistani fish protein concentrate

The Pakistan Council of Scientific and Industrial Research, Karachi has developed a technology for the production of fish protein concentrate in flour form (pre-cooked) and water soluble form. The process is based on enzymatic hydrolysis and no solvents are used for deodourization which render the concentrate for human consumption. Raw material is non consumable varieties of fish of lesser commercial value, available in large quantities. Most of the plant can be fabricated locally, barring a couple of specialized units. The pre-cooked protein concentrate can be used to fortify wheat flour, cereals, pulses etc. The soluble concentrate has unnoticeable fishy odour which can easily be masked with flavours when used in tonics, syrups and beverages. The product is perfectly

safe, easily digestible and readily assimilable
(Asia Pacific Technology Digest July-Agust 1983;5)

110 Frozen foods that need no thawing

An American process now being launched in Europe allows many food products to be kept at normal freezer temperatures of around -18°C without actually freezing solid. For consumers, the major attraction of the Freeze Flo process developed by Rich Products Corp of Buffalo, New York, is that because the products are not frozen hard they may be eaten, divided or poured straight from the freezer without the normal delay for thawing.

For manufacturers the Freeze Flo process is claimed to give substantial energy savings and to double or treble shelf life because of improved microbiological stability. The process eliminates all free water and, by osmotic control, lowers products' freezing points to below normal freezer temperatures. Energy is therefore required only to cool the products not to absorb the latent heat of a phase change.

Rich has marketed Freeze Flo desserts fillings and icings in the USA since 1980 and has also proved the process for soup and fruit juice meats. Freeze Flo is covered by a sheaf of patents, 17, according to the Rich chairman, Mr Robert E, Rich.Rich's activities in non dairy products have traditionally been strong on emulsification. Although details are secret, the process used is a natural one. It isolates and controls the water content of the product that is frozen. Free water thus becomes bound to other natural substances like proteins salts and sugars. This means that the water does not crystallize or freeze solid. Further than that, the process allows products to be kept soft at low temperatures and it cuts out the attemperating process when products are taken from a freezer, either for consumption or further processing.

The technology may open up new product fields and allow processors to overcome some longstanding difficulties. A particular instance of this is in the field of fresh frozen fruit where products such as strawberries and peaches traditionally unsatisfactory when frozen, because of the large amounts of free water, cannot only be frozen and thawed without sogginess for straightforward consumption but can offer the same advantages in such fields as bakery and confectionery where they are used for fillings

or for decoration.
(Food Trade Review 53(2); 1983· 90)

111 Food from factories soon

Imagine a world where food will not be grown on farms any more but will be produced in factories instead. If Dr. Clair C Folsome a U.S. biologist, has his way then this is exactly what will happen and quite lik in the very near future. The doctor who has already established the methodology in this laboratory says it is possible to produce all kinds of food, beans, rice, wheat peas, carrots, whatever in factories on a mass scale in about two years frcm now. Dr Folsome and Mr F.T. Andrews a consulting engineer, who is collaborating with the farmer on this projec said that the method will eliminate the need for ploughing, cultivating, fertilizing or irrigating. Moreover the crops will have no roots, stems or leaves and may be grown all the year round in factories which wil function like breweries or oil refineries. The cost of producing food in this way should be one tenth of the expenditure through conventional methods. Since food produced in factories will not be dependent on weather and rain the risk of crop failure is practically eliminated. Folso and Andrews look up on the method as a means of banishing world hunger. The novel process bypasses several steps that plant has to go through befo producing food. All the nutrition and other needs of the plant are provided in a factory environment and at a much faster pace. Folsome's interest started with his experiments on growing food in laboratories for future space ships. The basic concept of food through factories is simple, but the mechanism by which the cell are cultured is very complex 'In fact we do not completely understand it'. The equipment required is (1) A tissue solution container which holds a sterile solution of live tissue that is to be cultivated(2) A reactor which contains elements of dialysis tubing in which the cells continually clone themselves. (3) A product container which collects the newly cloned cells and settles them so that they can be separated from solution. (4) A nutrient solution container which holds the nutrients that the cells need in order to grow. Asked what could happen to all the farmland under cultivation if food

began to be produced in factories, Folsome said that it would then be available for housing and for meeting other human needs. Folsome and Andrews feel that the new methods will revolutionize agriculture and will have tremendous social and economic ramifications particualrly for countries like India where a majority of the population is engaged in agriculture.
(PTI Science Service 3(12); 1984; 16)

12 Improved process for pepper canning

A team of scientists at the Regional Research Laboratory, Trivandrum has developed an improved process for canning green pepper. Earlier attempts for canning green pepper had failed due to discolouration of covering liquid, rupturing of berries, gelation and sedimentation. The new process is said to have overcome these problems, The process involves selection of pepper at a slightly immature stage which is despiked and steeped in chlorine water for 30 minutes. Then the berries are washed thoroughly, filled in cans of required sizes and filled with brine containing certain additives. The cans are then exhausted, sealed and processed for required duration. The problem of discolouration has been solved by suitable adjusting the PH of the covering liquid. The rupturing of the berries, gelation and sedimentation of starch is prevented by adjusting the heat processing.
(PTI Science Services 3(10); 1984; 8-9)

13 Dry packed-green pepper

This is developed at Regional Research Laboratory (CSIR), Trivandrum. The freshly harvested green pepper is cleaned after despiking. The berries are throughly cleaned in water, which are steeped in saturated brine solution containing chemicals. While curing, the enzymic action is inhibited and the brown discolouration is prevented. It is then drained, packed in suitable flexible packages.
(Documentation Bulletin No. 54; 1984;18)

BY PRODUCTS AND WASTE UTILIZATION

Nil.

PROCESSED PRODUCTS

114 New milk foods for infants

The National Dairy Research Institute (NDRI), Karnal has succeeded in developing a complete range of four formulae for spray dried milk foods for infants which are similar to breast milk when reconstituted with water. Developed by Dr B.N.Mathur, the formulae conform to the new compos tional standards proposed by the working Group set up in 1980 by the Ministry of Social Welfare on the formulation of code for the manufacturin and marketing of infant foods in the context of WHO/FAO Codex Alimentarius Commission's formulations. The negotiations are under way for transfer of technology developed at NDRI to Amul Dairy, Anand (Gujarat),. The new formulae which contain 12% protein against 22% of other commercial formulae caters to various categories of infants from normal babies to abnormal babies having physiological disorders, and added that these milk foods have undergone successfully feeding trials on more than 500 infants. The compositional data of the formulae has been collected from the human milk from about 80 mothers who had normal infants, and about 300 mothers who had pre mature infants with physiological disorders. The lactational changes i transitional period from colostrum to mature milk have also been investigat All the new formulae, which would cost half the price of the commercially available foods.The first formula containing 12% protein, 18% fat, 64% carbohydrates, vitamins,calcium phosphate and sodium potassium, is ideally suited for infants born at normal time with normal weight, he said. The second is bifidus containing formula which bears close similarity with moth milk. The formula evokes similar physiological response amongst infants as breast fed infants. It is also meant for normal babies, but it provides protection against diarrhoea and enteric infections. The third is lactose hydrolysed formula for infants who suffer from gastro enteritis or have lactose intolerance (inability to digest milk) or vomit after consuming mil The fourth one is the special formula for babies born prematurely and underweight. The composition of the premature infants 'mothers' milk differs from the milk of the mothers giving birth to normal babies. Some pre-mature babies are too weak to suckle at the breast and need to be tube

fed orally, and in the face of it this formula is more important since no special feeds are available in this country.
(PTI Science Service, 3(11); 1984; 8)

115 Israeli concentrated carrot juice

Carrot juice is one of the most popular health-drink because of its fresh taste, pleasant flavour and its rich content of carotenoids, which are precursors of Vitamin A. Hundred grams of carrot yields 7.5 mg. of provitamin A. The juice also contains 6.8% sugar, 60 mg sodium, 300 mg potassium and 1 mg iron per 100 grammes. The Division of Agriculture and Applied Biology and the R&D Authority of Ben-Gurion University, Beer-Sheva, has found out a method to produce carrot juice in concentrated form with long shelf-life. When diluted with water, it will yield fresh-tasting carrot juice. The concentrated juice can be stored for 4 weeks without significant reduction in the active carotene content. When deep-frozen, it can be stored for 4 months without change.
(Asia-Pacific Technology Digest, July-August 1983; 15)

116 Glazing confections

Confection Glaze-called Opaglos GS-2-0400-reportedly eliminates many of the production problems inherent in the glazing with conventional raw shellac. The alcohol is Opaglos evaporates more rapidly than in conventional shellac so that drying times are reduced. This eliminates problems with product sticking to equipment or product sticking to product. Also, 25-50% less Opaglos than conventional shellac is required to achieve the same glazing results. One or two coats of Opaglos can produce a high-gloss, nearly transparent glaze that eliminates waxing and polishing steps. Opaglos forms an effective moisture barrier for confections that are hydroscopic in nature. It can also be used to prevent the outward migration of oils in nuts and fruits that often distorts or damages surface color.
(Food Technology 37(11); 1983; 68)

117 Encapsulated vitamin products

Encapsulated vitamin products have been developed for use in dry food products such as milk powders, infant formula, breakfast cereals, and dietetic

products. The products include gelatin-coated vitamins A, D, and E, as well as custom-made premixes of vitamins and minerals. The vitamin product are manufactured by a microencapsulation process, which results in a product with improved stability and small particle size for better distribution of vitamins in the finished product. The vitamin products are manufactured by Danochemo A/S Denmark.
(Food Technology 38(4); 1984; 127)

EQUIPMENT AND MACHINERY

118 Cookers for industrial kitchens

Rosieres offer two new cookers, which take advantage of the exceptional qualities of steaming, wherever only gas can provide the power required for the operation of this type of equipment. The GI cooker is fitted with a single 70-litre cooking compartment and a simple and robust steam generator. The GS2 cooker, which comprises two 70-litre cooking compartment and a simple and robust steam generator. The GS2 cooker, which comprises two 70-litre cooking compartments and a steam generator with a high energy output, has been developed in co-operation with Gaz de France
(Industrial Products Finder 11(9); 1983;90)

119 A smoke-free cooking oven

Magan choola, specially designed to suit the villager's need, is a boon to village housewives as it is smoke-free and saves about 25 per cent fuel. Made from locally available materials in the villages this choola is not only less expensive but can be built easily too.
(Khadi Gramodyog 30(4); 1984; 190-194)

120 Hot air oven

A hot air oven of thick MS has been introduced. The oven has a double walled construction, the gap of 8.89 cm between the two walls being filled with glass wool. The inner chamber is painted with heat resistant aluminium, and the outer with grey-silver hammerstone. The outer door is fitted with chromium plated lock hings. Three side-heaters of nichrome resistance wire coils work at black heat, and are connected to the inner chamber from three sides. A thermostat maintains

a temperature of up to 250 ± 2 C. A dial type thermometer is fitted on the door.
(Cardomom 17(4); 1984; 18)

21 Solar still

A simple and inexpensive solar still has been developed at the Centre for Development of Rural Technology, Ahmedabad. Three litres of distilled water can be prepared in 24 hrs by using solar energy from the still. The still costs about Rs. 1,500 and has an anticipated life of 10 years. The distilled water can be used for making solutions of chemicals for laboratories and solution of acids for batteries.
(Science forVillages No. 79-80, 1984; 2)

22 Heatless air/gas dryer

Mikron Engineers manufacture a compact, fully automatic, pressure swing heatless dryer in which the compressed air/gas flows between two towers by valves controlled by a master control timer. Wet air passes upwards through one of the towers and becomes dry dueto moisture removal by a desicant, and exits at the top. A small portion of the dried air is reduced in pressure and passed downwards through the desiccant bed in the other tower, removing previously collected moisture and reactivating the desiccant bed. This is vented to the atmosphere. At preset intervals, the two towers are alternately placed on stream or purge. Before the purge tower goes on stream, it is slowly repressurised. The unit dries air used in pneumatic tools; cylinders and motors; air guages, food processing, packaging and aeration of ice creams; cryogenics and plastic moulding.
(Industrial Products Finder 12(3); 1983; 115)

23 Fish dryer

A fish drying machine that can handle 400 Kg of fish in 12 hr when run on agro-wastes such as coconut husks, has been developed by a team of German and Philippine fisheries specialists. The machine makes the production of dried salted fish ('daing') possible even during rainy seasons and enables small-scale fishermen to earn more.
(Fishing News International 23(1); 1984; 30)

124 British crab meat separator

Bead Engineering Company Limited of U.K. has developed a Crab meat separator to conserve much usable meat which is wasted because of the difficulty in separating it from other wastes when normal methods are employed. White and brown meat obtained from crab shells and claws opened with airblowers is separated by hand. Cleaned shell, body and claws with residual meat is fed to a mincer with 10 to 12mm diasieve plates. The mince is fed to air agitated brine solution in the separatio tank with pressure regulator and valve control where air sparge (blow) depth and flow are adjustable. The shell sinks and is discharged. Meat floats to the surface which is passed over a weir and dewatered by a parabolic wedge wire (1 mm) screen which separates water for further reci culation. A pump with easy to remove end plate and a removable coarse screen assures overflow and draining. A coarse wire further prevents any meat passing through the parabolic screen and being recirculated. Sh settled in the tank is separated by a screw auger.

The machine is made of stainless steel and assures an additional 45k crab meat per hour which increases the yield per hour by 22%.
(Asia-Pacific Technology Digest July-August; 1983; 9-10)

125 Pneumatic conveyor for granules

AEW have developed a pneumatic suction-type vacuum loader for light-weight granules such coffee seeds, foodgrains, etc. The device comprises a vacuum pump, cyclone separator built in a hopper and a suction probe. The pump creates a powerful vacuum upto 2,000 mm WG in the hopper thereby sucking the granules through the suction probe connected by hose pipe. The granules are separated from air and stored in the hopper while the air after filtering, is released to atmosphere. The hopper capacity is based on the requirements of production machine ranging from 50 to 400 litres. The conveying cycle timings of forward-pause-blow back-pause are designed depending on the storage hopper capacity and machine consumption. The material can be lifted up to 4.5 m and conveyed horizontally up to a lengt of 25 m. The hopper can be installed directly on the hopper of the extru

or injection moulding machine. The average conveying rate for PVC granules is 20 kg, a minute. For continuous conveyance of PVC granules, the system can be converted to a pressure system with some alterations. *(Industrial Products Finder 11(9); 1983; 127)*

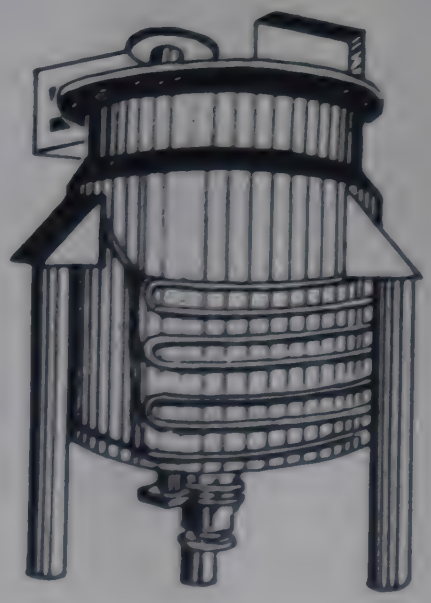
Plate heat exchanger

Star, in technical collaboration with Hisaka Works Ltd. of Japan, manufacture a compact plate heat exchanger that provides high transfer co-efficient and permits good counter current flow. A heat recovery of over 90% has been claimed to be possible. The herring bone exchanger plate comes in stainless steel, titanium hastelloy and other metals to suit the requirements. The gasket is of the teflon cushion type, which allows the plate heat exchanger to be used in fields where chemical resistance and durability are required. The exchanger is used by chemical, brewery, food processing and engineering industries for heating/cooling of process liquids, heat recovery, industrial cooling water and airconditioning systems.

(Industrial Products Finder 12(3); 1983; 81)

Electric surface heater

Tempo's Tempanel is an electric surface heater made to suit specific needs and finds applications mostly for temperature holding rather than temperature raising. Typical uses are in maintaining the liquids at correct handling temperature for ease of pumping, flow through pipes and valves for emptying of tanks containing low melting solids for viscous materials such as chocolate liquid glucose, malt extracts etc.; and warming of working surfaces used by pastry makers and other food industries besides many other applications. Auxiliary equipment for temperature control and indication can also be supplied.



(Industrial Products Finder 11(9); 1983; 67)

128 Test tube shaker

Expo offer a machine for shaking chemicals in test tubes, beakers, fl funnels and other laboratory glassware. The unit is made of heavy guage mild steel sheet outer cover duly painted and base of the same material with rubber legs. A heavy duty motor is fitted inside with eccentric motion and speed regulator for taking the desired motion. An upper tray is provided with clamp for holding the glassware. On/Off switch and wire cord are the other features.

(Industrial Products Finder 12(3); 1983; 179)

129 Cheese/casein press

DGS manufacture a cheese/casein press for use in dairies which produce cheese. In the initial stages of processing, the casein contains a lot of moisture (whey), which has to be removed by pressure. Wet cheese/casein i filled in a telescopic type of hoop which is placed horizontally on the press frame between two plates and mechanically pressed by a hand screw. Excess pressure can be applied by a capstan wheel provided near the moving

(Industrial Products Finder 12(3); 1983;29)

PACKAGING

130 Bulk rice now in the bag

Tilda Rice, one of the leading importers and millers of rice in the U use Bowater paper sacks, in 10 kg and 20 kg sizes, almost exclusively for bulk deliveries of milled rice. Tilda Rice, who operate from Leicester, i "cargo" or brown rice from all over the world. At their highly automated factory, they mill, refine and pack five different types of rice, ranging f pudding to Basmati.

The company was one of the first major rice distributors to switch fr traditional jute sacks to paper. The Bowater sacks it now uses are triple-

ply paper with a bleached kraft outer flexo printed with a blue and red design. These are filled and top stitched automatically before being loaded directly on to pallets. For maximum security, the outer ply of the sacks is coated with an antislip treatment and is made of wet strength kraft. Additional product protection is provided by use of a polyethylene coating on the middle ply, which provides a moisture barrier.
(Food Trade Review 53(3); 1983; 150)

31 Frozen lobsters stay fresh two years

A new packaging system, based on Du Pont's Surlyn ionomer resin, has enabled Blue Nose Fisheries of Canada, to keep frozen lobsters fresh for two years, while production speeds are six times higher, without increase in package cost. While the freezing process can slow down deterioration of the lobster, it does not inhibit it completely, as some oxygen is still left. If this remaining oxygen is extracted by vacuum packaging, deterioration is virtually halted. The use of a film combining the properties of polyamide ionomer provides an excellent barrier to oxygen that might otherwise re-enter the pack.

Early trials were made using pouches of polyamide and polyethylene films carrying a brine solution. While the contents emulated sea water and kept out oxygen to some extent, the frozen package could not provide the necessary shelf life. These problems were solved with the new material combination. Here, the toughness and puncture resistance of Surlyn ionomer resin offered better protection against the sharp spines and claws on the lobster. The presence of ionomer also ensured a good seal through the brine solution. With the new vacuum packaging system, the film is first drawn into a mould. A lobster is then placed into the depression and the cavity filled with brine solution. A second layer of film is passed over the top, vacuum is applied and the package is heat sealed. Machine speeds range from 39 to 52 lobsters per minute, depending on lobster size. When the lobsters were packed in pouches, an average of 9 per minute could be processed.
(Food Trade Review 54(1); 1984; 26)

132 Filling apparatus

Temperature gauges working on vapour pressure principle need filling refilling of alcohol, ether and other media. Industrial Electronics of Pune manufacture an appratus to fill measured quantities of these liquids under vacuum conditions in the sensor units and capillaries. As a prelude to filling, all air and residual liquid is evacuated from the system using a high quality vacuum pump. Simultaneous operation of two hand shut-off valves allows the liquid medium to flow into the system as the vacuum plant is isolated from it. Facility to mount the apparatus on a wall or on a worktable is provided.

(Industrial Products Finder 12(3); 1983; 137)

133 Bottle filling machine

Universal Filling Machine have enlarged the Posifill range of semi-automatic volumetric filling machines (40 cc-1000 cc) with the addition of the Posifill 1000 (range of fill 100 cc-1,000 cc) fitted with a Pall Sealkleen filter unit for terminal filtration filling. Another addition is a machine fitted with a multi-dose unit to allow, say, 5-litre containers to be filled or for the machine to be set to give a definite number of reapeated fills, at the same time pacing the operator. Other machines include the Posifill 1/50 designed to fill volumes of liquids from 1 cc up to nearly 50 cc, and a semi-automatic in-crate milk filling machine for use by producer/retailer dairy farmers. The output of the machine, constructed with a stainless steel chassis, is just over one crate (20 bottles) per minute. A modified version of this machine is available for the chemical industry whereby chemicals in winchesters can be filled whilst in wire crates etc.

(Industrial Products Finder 11(12); 1983; 62)

134 Filling machines

Automatic powder filling machines for filling powder in containers, bottles, etc., with accuracy has been developed. The system uses auger screw ac-break mechanism. Solid state thumb wheel selectors can change

fill quantity to any desired weight without stopping the machine. Fifteen to 40 fills/min are possible, depending upon the quantity in each shot. Machines with capacity from 10 to few kg, discharge per shot are available. The unit operates automatically, when the container is placed under the machine. Built in continuous low speed scribers help in mixing different powders while filling and avoid crater formations. T he control unit can be installed at remote location. The total number of fills is automatically registered with five digit counter. The system operates on single phase on three phase AC and occupies less than table space.
(Cardamom 17(4); 1984; 18)

Automatic bagging/filling System

Tyco (India) manufacture an automatic open mouth bag placer in technical collaboration with Grief Werk, of Fed, Republic of Germany. The machine is designed to improve and streamline automated bagging and filling system. It places suitable plastic and paper sacks fully automatically and can be used in conjunction with automatic weighers, sack closing machines and complete bagging lines. The placer's output is up to 800 bags per hour, depending on filling, quantity and product. The range of adjustments covers bag widths of 500-700 mm and lengths of 800-1, 1,300 mm. Capacity per magazine compartment is approximately 200 bags.
(Industrial Products Finder 11(9); 1983; Coverpage)

Label pasting machine

Innovative Engineers offer the Vihot label pasting machine for industries manufacturing pharmaceuticals, brewery products, matchboxes, etc. The machine features automatic label feed; a facility for adjustment of adhesive layer; a variable output of 1 to 70 lables per minute; single label delivery option; and a device to keep in glueing roller in motion even when the label delivery is not in operation.
(Kassia bulletin 24(3); 1984;6)

Semi-automatic packaging machine

Samarpan Fabricators, in collaboration with prepac of France manufacture a semi-automatic machine, the Model Prepac-B, for packing liquids, viscose and powder products such as milk, oil, ghee, vanaspati, etc. Products can also be packed in laminated film pouches (of different films), sealed

on four sides. Prepac-B incoporates a moving jaw activated by a foot switch; the jaw has safety guards. Doses can be adjusted from 100 to 1,(ml, and up to 300 to 400 pouches can be filled per hour. Meant particula for the small and medium-scale manufactures, the machine measures 2,000 h x1,200 w x 400 mm depth, and weighs about 250 kg.
(FFNDAI Newsletter No.4; 1984; 1)

ANALYSIS

138 Vibrotone: a can vacuum measuring instrument

The device enables accurate measurement of vacuum in sealed cans containing food products non-destructively. The patented instrument consists of two parts, a mechnical arrangement and an electronic measuring system. The electronic part comprises a power supply, a switch, a transducer (which acts both as an exiciter and as a sensor), a signal conditioner, control logics and a front panel display. When the pedal is operated by foot, the can in which the vacuum has to measured comes close to the transducer. Now, when the front panel trigger button in the electronic circuit is pressed, the transducer functions. It transmits a very high intensity electro-magnetic pulse which causes the top lid of the can t vibrate. The sonic signals are picked up by the transducer and conditioned by the signal conditioner. The conditioned signals enable the control logic to determine the vacuum in the can. The measurement of vacuum is divided into four different ranges which are indicated on the front panel. display as L, O, H or E for low, optimum high or excess respectively. The values corresponding to each range could be altered at the time of calibration according to the type of can and the place. Four counters on the panel indicate the number of tested cans corresponding to each range.

Calibration of the instrument is simple. All we need is a vacuum pump and an accurate vacuum guage. The can is fitted with two nipples diametrically opposite to each other on the curved surface at the top near the lid. One nipple is connected to the pump through a glass stopper and the other to the vacuum guage with a rubber/plastic tube. The head space in the can is slowly evacuated by operating the pump. The vacuum is set respectively at (L/O), (O/H) and (H/E) cm of mercury. The corresponding average values of voltage are taken for several trials for the same can and similarly for other sample cans. The averages of these for each

setting are taken as 'set points' for the instrument. Appropriate tag points provided at the rear of the instrument may be used for setting these values. The instrument, helps to classify the cans based on vacuum insided as excess high optimum, low or nil thus enabling online checking during manufacture. It can discriminate vacuum within +2mm of mercury. With little experience, an operator can manually test over 600 cans/hr.
(Invention Intelligence 19(1) 1984 31 33)

139 Temperature/Pressure Measurer

Tamil Nad Instruments manufacture a variety of temperature and pressure measuring instruments, including bimetal vapour pressure and mercury in steel type dial thermometers. These instruments not only indicate prevailing temperature/pressure but also control temperature/pressure by means of electrical contacts provided.
(Industrial Products Finder 12(3) 1983 145)

140 Micro processor equipped analytical balance

Analytical balance is microprocessor euipped and features of a 109 g weighing capacity and a 0.1 mg readability. Called the AE100 the balance features a weighing pan that is close to bench level a tall weighing chamber that is accessible from the top as well as from the sides and a touch bar control and display that are at weighing pan level. Weighings are simplified to the touch of the balance's single control bar which operates on/off, and tare, sets integration time; adjusts stability detector mode and calibrates the balance. If weighing results need to be transferred to a printer or computer, an optional data output is available.
(Food Technology 37(11); 1983; 63)

141 Portable colour comparator

This may be used for rapid evaluation of colored materials. The unit, called that BI 100, features a remote photocell detector head which

makes it possible to measure the three tri-stimulus colours-red, green, and blue-without filter changes or other adjustments. The probe, which consists of the photocell filter assembly and illuminator, is a separate unit connected by a 6 ft cable. The remote nature of the sampling head permits color reflectance measurements of solids, liquid, and powders regardless of whether they are large objects, immovable test areas, or small test samples. The instrument displays percent reflectance readings in digital units on 0-100% scale for each of the tri-stimulus color values. The peak color wavelengths of the detection system are 436 nm for blue, 546 nm for green, and 640 nm for red. Housed in a portable cabinet, the instrument combines a regulated power supply and a digital display in one unit.

(Food Technology 37 (11); 1983; 63)

142 Gas Chromatograph

Aimil-Nucon offer the Series 5700 gas chromatograph, which is an all glass system. The instrument is modular so that one can begin with a basic unit and add capabilities needed or one can start with the most powerful versatile GC system. All temperature controllers are digital. The output is available on potentiometric strip chart recorder and terminals for printer plotter/data station/computer are provided. Also available are chromatography supplies such as glass and metal columns, septa, chart rolls swagelok type fittings, nuts ferrules, needle valves, flow controllers gas sampling valves and gas tight and liquid syringes.
(Industrial Products Finder 12(3); 1983 145)

143 Interface Detector/Moisture Measurer

Roop Rasayan have developed the Conan range of process instruments for the detection and control of interface of two immiscible liquids, measurement of moisture content in solids and liquids, and viscosity measurement in gelatin and polymers. The range has a built-in 4-digit display. Options available include high and low level alarm settings auto or manual mode

selection and adjustable delay control for the relay. Units are also available in non-contact version. The instruments find applications in hydrogenation plants, soap manufacturing, sulphonation process, capsule manufacturing and other chemical and pharmaceutical processes.
(Industrial Products Finder 12(3); 1983; 131)

4 UHT Sterilizer

Ultra-high temperature (UHT) sterilizer for dairy products eliminates problems with degradation of protein and burning that cause the finished dairy product to have a cooked flavour and poor colour. The sterilizer, called and DASI Free falling film TM sterilizer, is described in a 6-p milk falls in thin sheets through an atmosphere of puresteam. The milk is subjected to heat only during the fraction of a second that it is falling. Because it is totally surrounded by heat as it falls, all the milk reaches the same temperature simultaneously. There are no hot surfaces in the sterilizer for the milk to touch, so the milk is sterilized but cannot burn. The skid mounted system features capacities ranging upward from 4,400 1b/hr. Homogenization, standardization, and addition of flavours can all be incorporated into the system.
(Food Technology 38(4); 1984; 137)

5 Magnetic Probe Flowmeter

Encon Systems offer a magnetic probe flowmeter, the Series 100, with a unique operating principle. The probe has a non position, sensitive design with no moving parts, no electronics and allows remote installation up to 30.5 metres from the transmitter. It can be used on pipes from 19.05 mm to any size and is suitable for measuring difficult fluids such as slurries and corrosive liquids. The probe generates a precise magnetic field which acts like an electric generator when the liquid moves through it, resulting in the generating of a voltage proportional to the liquid flow velocity. This voltage is picked up by the probe's electrodes and is processed to provide output signals proportional to the flow. Other features include a reverse flow indication light, an integral flow simulator for calibration and test and an adjustable damping from 1-10sec. The flowmeter finds applications in slurries, waste water, water solvents,food, etc.
(Industrial Products Finder 11(9); 1983; Cover page)

146 Reverse osmosis/ultrafiltration unit

Laboratory-scale reverse osmosis/ultrafiltration unit called the DDS 20 RO/UF Module-may be used for testing a wide range of membrane filtrati applications as well as testing any flat sheet reverse osmosis/ultrafiltr or micorfiltration membrane. The system is designed to use a minimum of sq ft and a maximum of 21 sq ft of membrane area.
(Food Technology 38(5); 1984; 214)

147 Salmonella test Kit

Detection of Salmonella in food and food products may be accomplished using the Salmonella Bio-Enzabead Test Kit, an enzyme-linked immunosorbent assay (ELISA) procedure. The test kit provides for identification of Salm contamination within 2 working days, compared to the 4-5 day period requir by current methods. The kit utilizes plastic-coated ferrous metal beads as the solid phase. Monoclonal antibody to Salmonella flagellar antigen is bound to the surface of ferrous metal beads, which are reacted with a dilut of the test sample. If Salmonella antigen is present in the sample, it wil attach to the antibody on the beads. Beads are then washed and transferred into a reaction mixture containing peroxidase conjugated monoclonal anti-Salmonella immunoglubulin, which will bind to any Salmonella antigen bound antibody molecules on the surface of the beads. Beads are transferred to a substrate solution where the appearance of the colour after 10 min indicate the presence of Salmonella antigen in the specimen. No colour indicates no Salmonella contamination.
(Food Technology 38(4); 1984; 134)

148 Amino acid analysis of protein hydrolysates by HPLC

Amino acid analysis of protein hydrolysates may be accomplished in 20 min using a special high-performance liquid chromatography(HPLC) column. The 0.46 X 12cm column is packed with an ion-exchange polymer that demonstra column efficiencies in excess of 100,000 plates/m and is stable from pH o to 14. Ion-exchange separation followed by post column reaction with ninhydrin or o-phthalaldhyde is a precise and accurate method to determine amino acids available. Unlike silica columns that use pre-column derivatization procedur the amino acid analysis column demonstrates remarkable column to column reproducibility.
(Food Technology 38(4); 1984; 135-136)

49 Enzymatic determination of sulphite

A new enzymatic method for the determination of SO_2 is now available in a kit form from Boehringer Mannheim Australia. Sulphite oxidase oxidises sulphite whereby H_2O_2 is formed, which then reacts with NADH in the presence of NADH peroxidase. The formation of NAD + is measured spectrophotometrically. Test conditions are such to optimise precision and accuracy, and the method compares favourably with the iodometric titration method. Using wine as the sample material, linear regression analysis has shown a high correlation with the iodometric method (r=0.923, n=12) and the distillation method (r=0.993, n=28) of Reith Willems. A 200 umol/L test solution is quantitatively converted within 20 min. Inferference from naturally occurring substances or preservatives in foodstuffs is minimal. Detailed experimental data and a method sheet for the enzymatic determination of SO_2 in a variety of foodstuffs is available upon request to Boehringer Mannheim Australia Pvt Ltd. 6-8 Byfiedl Street North Ryde, NSW 2113.
(Food Technology in Australia 36(2); 1984; 67)

50 Limonin determination by immunoassay

Limonin content in citrus juices can be determined using the Bitterdetek TM immunoassay kit. Limonin is the major bittering agent in processed citrus juices. Limonin content, as determined using the Bitterdetek test, can be used to set extractor levels for maximum juice yield with acceptable limonin content, and to blend juice batches to reduce limonin content and, ultimately, to improve the taste of the juice. The Bitterdetek assay is based on the immunological principle of antigen-antibody complexes. A single technician can test and analyse as many as 80 samples for limonin in an hour. The equipment required include photometer, a multichannel pipette, and a forced-air microplate incubator.
(Food Technology 38(5); 1984; 214)

51 Detection of DDT in fatty foods

Scientists at the Central Food Laboratory, Calcutta have evolved a method for quickly detecting and determining pesticide content in fatty foods. The detection can be completed in 45 min and the recovery was 99 per cent. The method consists of extracting pesticides from oil such as mustard oil, groundnut oil or fatty foods like milk with acetone and acetonitrile. The extract

is passed through silanised glass wool column with activated charcoal ar concentrating the elute. The elute is then analysed by GLC and TLC. Th detection was so accurate that it was of the order of nanogram in the ca GLC and microgram in the case of TLC. Pesticides from groundnut oil and milk were also extracted in a similar manner and the method was found to simple. The scientists said the method can be applied detecting all kin pesticides as well as carbomates even though occurrence of carbomates in was rare.

DDT is one of the chlorinated insecticides which is used so indiscri tely these days. One of the difficulties with detecting DDT is that it i fat soluble substance. It therefore can be deposited in the adipose tiss So it can pass into milk easily making detection and removal of DDT in mi difficult. The Calcutta scientists say though removal of pesticides from acids can be made by extraction and clean up, none of them is suitably be For example, large amount of waxes and pigments which also come out durin traction interfere with analysis. Cleaning operation is also time consu since this requires treatment with adsorbents such as alumina etc.
(PTI Science Service 3(1); 1984; 8)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIAL)

152 Area and Production of turmeric during 1982-83

State	Area ('000 ha)	Production ('000 tonnes)	State	Area ('000 ha)	Product ('000 t
Andhra Pradesh	21.6	63.7	Meghalaya	1.1	1.6
Assam	8.1	5.0	Orissa	25.3	22.2
Bihar	4.2	7.0	Rajastan	0.1	0.2
Haryana	-	-	Punjab	-	-
Karnataka	2.4	9.8	Tamil Nadu	9.9	35.9
Gujarat	-	-	Tripura	0.9	1.4
Kerela	3.2	5.8	Uttar Pradesh	0.6	0.7
Jammu & Kashmir	-	-	Arunachal Pradesh	0.2	0.4
Madhya Pradesh	0.4	0.3	Mizoram	0.1	0.3
Maharashtra	8.3	13.2	Nagaland	-	-
			Total	86.4	167.5

(Directorate of Economics and Statistics New Delhi, India)

(Production '000 tonnes)

State	Gram	Tur	Black gram	Green gram	Horse gram	Moth bean	Lentil	Lathyrus	Pea	Other Pulses	Total Pulses
Andhra Pradesh	18.3	45.3	119.6	23.52	86.1	-	-	-	-	8.2	301.0
Assam	1.7	5.8	-	-	-	-	-	-	-	45.3	52.8
Bihar	138.0	86.5	46.8	3.3	34.8	-	-	-	-	5.7	315.1
Gujarat	120.8	194.9	-	-	-	-	-	-	-	119.5	435.2
Haryana	282.0	9.2	4.8	3.6	-	0.6	9.7	-	3.5	1.3	314.7
Himachal Pradesh	1.6	0.3	0.6	-	0.1	-	-	-	-	12.6	15.2
Jammu & Kashmir	0.8	-	8.3	4.4	0.8	11.6	0.4	-	1.7	3.4	31.4
Karnataka	70.7	118.6	14.4	59.9	168.2	-	-	-	-	26.7	458.5
Kerala	-	0.7	1.8	1.4	9.1	-	-	-	5.4	27.8	46.2
Madhya Pradesh	1454.6	343.1	168.5	28.2	43.4	31.2	118.4	185.0	33.4	0.7	2406.5
Maharashtra	147.9	398.9	150.7	147.9	51.2	26.8	3.6	14.1	3.0	18.8	962.9
Manipur	0.1	-	-	-	-	-	-	-	-	1.5	1.6
Meghalaya	20.1	0.9	-	-	-	-	-	-	-	1.0	22.0
Nagaland	-	-	-	-	-	-	-	-	-	1.6	1.6
Orissa	24.3	87.3	239.7	318.9	137.8	-	-	-	-	113.6	921.6
Punjab	62.0	18.6	7.0	23.8	-	0.6	-	-	-	0.1	112.1
Rajasthan	1321.6	7.6	47.6	17.4	-	143.7	-	12.6	9.1	6.7	1566.3
Sikkim	-	-	-	-	-	-	-	-	-	6.0	6.0
Tamil Nadu	4.6	30.2	51.9	23.7	77.0	-	-	-	-	12.5	199.9
Tripura	0.2	0.2	0.2	0.1	-	-	-	-	-	1.8	2.5
Uttar Pradesh	1391.4	544.5	49.1	73.9	-	0.2	203.1	-	248.7	-	2510.9
West Bengal	50.6	25.5	50.3	13.0	3.0	0.2	32.6	24.1	1.2	2.8	203.3
Andaman & Nicobar islands	-	-	-	-	-	-	-	-	-	0.3	0.3
Dadra and Nagar Haveli	0.1	0.9	1.4	-	-	-	-	-	-	0.2	2.6
Delhi	0.5	-	-	-	-	-	-	-	-	0.4	0.9
Goa, Damn, Diu	-	-	-	-	-	-	-	-	-	-	-
Mizoram	-	-	-	-	-	-	-	-	-	0.1	0.1
Pondicherry	-	-	0.8	0.4	-	-	-	-	-	-	1.2
All India Total	5091.9	1919.0	1463.5	743.4	611.5	214.9	358.8	235.8	306.0	418.6	10932.4

(Agricultural Situation in India 38(7); 1983)

All India final estimate of food grain production (1982-83)

(Production - in thousand tonnes)

State	Rice	Jowar	Bajra	Maize	Ragi	Small millets	Wheat	Barley
Andhra Pradesh	7,583.2	1,279.1	262.3	710.3	234.3	147.0	7.9	-
Assam	2,579.8	-	-	12.2	-	4.0	117.9	-
Bihar	3,059.8	3.7	5.4	700.0(P)	74.9	37.8	2,201.8	67.0
Gujarat	488.9	487.9	1,178.0	306.0	43.2	54.3	1.352.3	12.9
Haryana	1,275.0	28.0	506.0	56.0	-	-	4,345.0	122.0
Himachal Pradesh	73.0	0.2	-	398.6	6.1	9.4	456.6	43.4
Jammu & Kashmir	574.5	0.1	7.1	406.9	-	8.4	203.7	6.8
Karnataka	2,062.0	1,586.4	199.2	380.8	1,321.1	123.7	202.3	-
Kerala	1,308.8	0.8	-	-	1.1	1.4	-	-
Madhya Pradesh	3,402.1	1,513.0	102.0	760.5	4.9	279.5	3,680.9	164.3
Maharashtra	1,948.8	4,652.5	444.9	107.6	215.0	74.9	803.3	5.7
Manipur	219.2	-	-	5.7	-	-	-	-
Meghalaya	123.0	-	-	21.3	-	2.7	4.6	-
Nagaland	108.4	-	-	13.0	-	-	-	-
Orissa	2,897.0	27.8	6.4	176.6	244.0	74.0	121.0	-
Punjab	4,147.0	1.3	50.0	542.0	-	-	9,183.0	126.0
Rajasthan	89.6	356.4	1,367.3	658.2	-	5.4	3,777.4	479.2
Sikkim	11.6	-	-	30.0	3.8	-	11.8	0.7
Tamil Nadu	3,300.0	439.7	244.8	46.8	288.6	201.8	0.2	-
Tripura	423.5	-	-	-	-	-	6.0	-
Uttar Pradesh	5,529.2	293.7	742.4	849.8	151.9	198.2	15,285.7	806.7
West Bengal	4,949.1	0.4	0.2	59.4	8.3	5.8	605.5	26.0
Andaman & Nicobar Islands	21.6	-	-	-	-	-	-	-
Arunachal Pradesh	94.2	-	-	25.9(P)	-	15.8	4.0	-
Dadra & Nagar Haveli	18.5	0.5	-	-	3.0	0.4	0.2	-
Delhi	3.5	4.2	10.2	0.4	-	-	131.3	1.4
Goa , Daman & Diu	118.7	-	0.5	-	8.2	-	-	-
Mizoram (E)	28.3	-	-	6.2	-	-	-	-
Pondicherry	42.5	0.1	3.4	-	2.2	0.1	-	-
All India Total	46,480.8	10,675.8	5,130.1	6,274.2	2,610.6	1,245.3	42,502.4	1,862.1

55 All India Estimate of Potato 1982-83

State	Area ('000 hectares)	Production ('000 tonnes)
Andhra Pradesh	0.3	0.9
Assam	43.3	250.2
Bihar	132.6	1237.9
Gujarat	11.4	288.9
Haryana	9.1	136.5
Himachal Pradesh	13.6	35.5
Jammu and Kashmir	1.7	3.1
Karnataka	11.9	87.5
Madhya Pradesh	28.2	279.5
Maharashtra	11.6	59.3
Manipur*	2.0	10.5
Meghalaya	17.8	142.2
Nagaland	5.8	40.6
Orissa*	9.5	66.4
Punjab	27.8	524.2(E)
Rajasthan	1.5	2.5
Sikkim	2.9	11.1
Tamil Nadu	12.1	77.9
Tripura	2.6	34.2
Uttar Pradesh	286.1	4435.9
West Bengal	115.9	2319.7
Arunachal Pradesh*	1.5	10.6
Delhi	Neg	0.2
Mizoram**	0.6	2.8
All India	749.8	10108.1

* - Data related to 1981-82 ** -Data relate to 1980-81
E - Estimated Neg -Negligible.

(Directorate of Economics and Statistics, Ministry of Agriculture, Government of India , New Delhi)

PRODUCTION (INDUSTRIAL)

156 Estimate of idle capacity of fish processing (freezing) plants in India 1978-81

(Based on 250 normal working days and double shift per day)

1	1978 2	1979 3	1980 4	1981 5
Annual installed capacity ('000 tonnes)	304.6	301.0	306.1	306.1
Estimate of idle capacity ('000 tonnes)	233.4	219.6	219.5	207.7
% idle capacity	76.6	73.0	71.7	67.8

1	2	3	4	5
Stratum-wise % idle capacity	.	.	.	.
Plants under 5 tonnes capacity/day	75.6	70.7	68.4	64.1
5 to 10 tonnes capacity/day	72.2	67.4	70.1	67.3
Above 10 tonnes capacity/day	81.0	79.4	76.0	71.8

(Fish Technology Newsletter, July-September 1983; 13)

157 Sugar production

According to the Indian Sugar Mills Association, the sugar production during the second fortnight of April, 1984 (i.e. 16.4.84 to 30.4.84) was a 2,03,000 tonnes as against 5,44,000 tonnes during the same fortnight last year. The total production in the month of April, 1984 the seventh month of the season 1983-84 was about 5,43,000 tonnes as against 11,94,000 tonne during the same month last season. This brings the total output during th first seven months of the season 1983-84 to 56,46,000 tonnes as against 73,35,000 tonnes during the corresponding period last year.

The total closing stock of sugar with the factories as on 30.4.84 was about 53,94,000 tonnes as against 67,73,000 tonnes on the same date last year.

(Indian Sugar Mills Association - Press release)

158 Copra and coconut oil

Kerala State accounts for 95% of the total production of milling copra which is estimated at about 325,000 tonnes in the country. The total production of coconut oil in the country is about 200,000 tonnes. Both rotaries and expellers are used for crushing and the average recovery of oi is 62.5 per cent in rotaries and 64 per cent in expellers. There are about 1461 milling establishments in India composed of about 130 expeller units and 1331 rotary units.

(PROFODCIL Bulletin 18(1), 1983; 7)

EXPORT

159 Higher export target for tea

The Government of India has announced its target for the export of tea in 1984 as 215 million kgs. This was stated by the Commerce Minister

Mr. Vishwanath Pratap Singh, while inaugurating the National Seminar on Tea, recently in New Delhi. He added that this had been announced to reassure buyers of this commodity that India is committed to export of tea and the temporary ban on CTC itself does not reflect any basic reversal of policy. The target announced for the current year is higher than the 1983 export achievement of 209.14 million Kgs.

Although considerable progress had been made in the production and India could take pride as the prime producer of quality teas, the Minister maintained that it was essential to evolve a long term and sustained marketing strategy if India was to ensure the retention of its leading position as the world's prime tea exporter. He specifically referred to Darjeeling tea as the "champaigne of teas" and hoped that the industry would match the efforts made by the Government for the revitalisation of tea gardens by proper and effective marketing of Darjeeling teas.

The production of tea in 1984 is estimated to be over 600 million kgs. In 1983, the production was 585 million kgs. and it was only at the end of the production year for North India when prices level did not show any sign of stabilisation that the Government decided to impose a restriction on exports of those CTC grade teas which are widely consumed domestically. This, the Minister observed, resulted in the stabilisation of tea prices in the domestic market. Referring to the unusual tea prices in 1983, the Minister stated that India had an abiding interest in stable and orderly conditions being maintained both in the domestic and international tea trade. The level of Indian exports over the past 30 years had been fairly stable and the importing countries could be assured that India would continue to meet its export obligations by achieving higher rates of tea production and productivity. In this context, Mr.Singh drew attention to the measures which were being implemented for tea production such as the strengthening of the developmental activities of the Tea Board through two regional offices. These were located in the heart of the tea producing areas of North-East and South India. Manned by senior officials they are liaising with State Governments in these areas to ensure active participation in developmental activities. Some efforts are being made to revamp research and development activities ensuring adequate availability of inputs and providing proper management for droughtprone areas. The draft Seventh Five Year Plan for the tea industry envisages an overall increase

in tea production to a level of about 765 million kgs. and with an estimated outlay of Rs. 9000 million. Apart from contributing over Rs. 10,000 million per annum to the GNP and Rs. 4000 million per annum as foreign exchange, the tea industry provides employment directly to nea one million workers, he added.
(Economic and Commercial News 14(17); 1984; 6-7)

160 Fall in cashew export earnings

India's export of cashew kernels during the calendar year 1983 registered a 12.3 per cent increase. During the year, exports amounted to 35,697 tonnes as compared to 31.787 tonnes in 1982. The increase was mai due to the increase in unit export price which in 1983 averaged Rs. 38.57 as compared to Rs. 47.42 and Rs 58.39 in the two previous years. Thus despite increased exports, the earnings realised during 1983 were less at 137.71 crores.

The United States with an intake of 22,199 tonnes reemerged as the largest buyer of Indian cashews during 1983. This represented 62 per cen of India's total exports for the year. This was also the highest since 1 when exports to the United States touched a peak of 29,000 tonnes. The U which was the largest buyer of Indian cashews in the past few years remai practically out of the market. The other important markets namely The Netherlands, Japan, Australia, Canada, Singapore, UK and German Federal Re have also increased their offtakes considerably during the year. In 1983 10,231 tonnes of raw cashewnuts valued at Rs. 6.86 crores was imported in India from Tanzania. During 1982 the imports were only 3,212 tonnes valu at Rs. 3.01 crores, the entire quantity being from Kenya and Madgascar. average unit import price in 1983 was Rs. 6703 a tonne as against Rs. 9,386 a tonne.
(Hindu March 26, 1984; 13)

161 Export potential-in large cardamom

Large cardamom (*Amomum subulatum* Roxb) is mainly grown in India, Nep and Bhutan. Certain varieties are also reported to be under cultivation China, Indonesia, Malaysia and Thailand.

In India, it is grown in Sikkim, Darjeeling district of West Bengal Arunachal Pradesh. The total world production (dry capsules) is estimate to be around 6,000 tonnes annually and India itself accounts for about 65 cent of it. In Sikkim it is grown over an area of about 11,200 hectares

produces about 3,000 to 3,500 tonnes of dry cardamom annually. The marketable production during the year 1980-81 was recorded to be approximately 3,258 tonnes. Another 500 tonnes of cardamom is produced in Darjeeling district of West Bengal from an area of about 1,350 hectares. Nepal and Bhutan also produce large cardamom to the tune of about 800 tonnes each annually.

During 1977-78, 218 tonnes of large cardamom valued at Rs. 4,269 million was exported as compared to 100 tonnes valued at Rs. 1,421 million in the previous year. Since the crop harvest year of 1976, the export has been channelised through National Agricultural Co-operative Marketing Federation of India Limited.

Singapore is the biggest market for Indian large cardamom closely followed by United Kingdom. Although Singapore's own consumption is very less but it re-exports the commodity to several other countries.

According to a recent survey made by the International Trade Centre, Geneva, Pakistan can become a very potential market for Indian large cardamom since it requires about 300 tonnes annually. The major supplier to Pakistan had been Nepal who has exported about 64 tonnes of large cardamom during 1977-78 and 110 tonnes during 1978-79. As compared to this, India exported to Pakistan only 10 tonnes in 1977-78 and only 8.5 tonnes during 1978-79

Attempts can be made to popularise large cardamom in Bangladesh, Sri Lanka, Fiji, Mauritius and Latin American countries. The consumption in catering sector (hotels and restuarants) is also limited because of the preference of people to European type of food. However, there appears to be some use in industrial sector particularly in meat and fish processing and need to be further intensified.

(Economic and Commercial News 13(51), 1983; 7-8)

62 Exports of spices from India during the year 1982-83

(Quantity: M.Tons, Value: '000 Rs.)

Commodities	Quantity	Value
Pepper	22,495.23	2,90,015.15
Dehy. G. Pepper	63.52	2,993.32
Pepper Powder	31.40	799.92
White Pepper	1.62	62.01
Total Pepper	22,591.77	2,93,870.40

(Contd.)

Contd.

Cardamom small	1,019.78	1,62,119.07
Cardamom big	87.53	1,769.95
Chillies	10,621.52	1,01,887.11
Chillies powder	2,266.94	21,656.80
Total Chillies	12,888.46	1,23,543.91
Ginger	3,918.01	58,188.41
Ginger powder	36.70	660.73
Total Ginger	3,954.71	58,849.14
Turmeric	4,984.88	27,878.96
Tumeric powder	2,609.88	14,475.20
Total Tumeric	7,594.76	42,354.25
Curry powder	2,815.95	33.607.90
Coriander seed	6,723.74	37,967.93
Corainder powder	654.73	6,625.92
Total Coriander	7,378.47	44,593.85
Cumin seed	1,695.06	30,277.88
Cumin powder	35.98	822.35
Total Cumin	1,731.04	31,100.23
Celery seed	2,025.95	14,049.97
Celery powder	3.50	19.77
Total Celery	2,029.45	14,069.74
Fennel seed	505.26	7,117.59
Fennel powder	-	-
Total Fennel	505.26	7,117.59
Fenugreek seed	3,965.30	16,822.23
Fenugreek Powder	1.54	13.66
Total Fenugreek	3,966.84	16,835.89
Garlic	5,503.23	25,809.37
Dehy. Garlic	187.61	2,123.26
Garlic Powder	104.55	1,356.88
Total Garlic	5,795.39	29,289.51
Nutmeg	5.03	26.85
Mace	3.51	102.50
Cassia	730.98	10,512.54
Cassia Powder	0.50	10.73
Total Cassia	731.48	

ntd.

Aniseed	-	-
Tejpat	59.53	208.66
Tejpat Powder	44.93	78.51
Total Tejpat	104.46	287.17
Misc. Spices	1,588.89	10,847.15
Oils of Spices	24.24	8,620.34
Oleoresins of Spices	214.27	35,465.49
Total	75,031.29	9,24.994.20

(Customs lists)

TRADE INFORMATION

3 India Trade Centre to be set up in Gulf

The Government of India proposes to set up an India Trade Centre in the Gulf region to boost exports to West Asia. It also proposed to strengthen India's commercial missions in those countries to promote trade links and economic co-operation

(Cashew Bulletin 21(1); 1984; 12)

4 Inland container depots

The Central Board of Excise and Customs have declared Coimbatore, Junction Station at Coimbatore, Bangalore Contonment Railway Station and Pragati Maidan at New Delhi as Inland Container Depots for the unloading of imported goods and the loading of export goods or any class of such goods. *(Cashew Bulletin 21(1); 1984; 14)*

FOOD REGULATION,QUALITY CONTROL AND HYGIENE

REGULATION

5 Labelling and Marking Requirements in F.R.G.

New German foodstuffs labelling legislation came into effect from January 1984. All consumer packed foodstuffs must bear labelling which complies with the new legislation. Foodstuffs with a minimum shelf life of more than 18 months which have been produced not later than 26 December 1983 may be traded with old labelling until December 1986. According to the new legislation the following items must be indicated on the labels:

--the name of product
--the net weight of the contents
--the minimum shelf life
--the identification of the main product and its ingredients in the order quantity
--the name and the address of the producer, the packer or of a distributor resident in the EEC.
(Trade Information Service, Trade Promotion Centre International Trade Division, ESCAP, Bangkok)

166 Proposes food irradiation rules

The Food and Drug Administration is proposing to allow irradiation of food at doses not to exceed 100 Krad (1 kGy) for inhibition of the growth a maturation of fresh fruits and fresh vegetables and for insect disinfestati of foods, and at doses not to exceed 3 Mrad (30 kGy) for microbial dis- infestation of spices. The regulations would also require that records be for one year past the expected shelf life of the product and be made availa for inspection of FDA. No retail labeling requirement is being proposed, b FDA is requesting comments on whether and how irradiated foods should be labeled.
(Food Technology 38(4); 1984; 49)

167 Closing date for Yellow No.6 is postponed

FDA has postponed the closing date for the provisional listing of FD&C Yellow No.6 until April 30 to allow for continued use of the colour while the agency evaluates its safety. Details are in the Federal Register of Fe 28.
(Food Technology 38(4); 1984; 49)

168 Ban on CTC grade tea export lifted

The Centre has decided to lift the ban on export of CTC (crush, tear an curl) grade tea with effect from May 12, 1984. Announcing this here today, N.R.Lasker, Union Minister of State for Commerce, said the decision had bee taken after careful consideration of the present and future prospects of availability of tea in the country. We will have to keep a careful watch o the situation forthe first few days and we need the cooperation of the indu to ensure that shipments are phased in such a manner that there is no undue rise in prices" he added. Regional Offices: Two senior-level regional offic

of the Tea Board will be set up in Guwahati and Coimbatore shortly to provide assistance and for better co-ordination Mr. Laskar announced today.
(Hindu May 13, 1984; 1)

9 Revised RBI forms for export declaration

According to a Reserve Bank recent release, the export declarations should be furnished in a revised form known as GR form instead of the present GRL form. Declaration should be furnished in a set of two copies of GR form Gr and pp forms could be obtained from various dealers in foreign exchange and directly from the Exchange Control, Department of Reserve Bank.
(Cardamom 17(3); 1984; 10)

0 Spices exports only in approved packs

Exports of spices will be permitted only in packs approved by the Commerce Ministry from August next. The consumer packs are being designed by the Indian Institute of Packaging, Bombay, and once approved, exporters will have to implement this decision within six months.
(Hindu June 27; 1984; 9)

1 New regulations for food imports into Oman

The Ministry of Health of Oman has announced that no food consignement will be allowed into the country after April, 1984, unless it carried a certificate from the country of origin stating that the food is free from contamination. The order also stipulates that all food containers and packs must carry the date of manufacture and expiry in embossed letters.
(Cashew Bulletin 21(1); 1984; 12)

2 Consumer complaints to industry

USDA's Food Safety and Inspection Service has established a new policy whereby it will notify appropriate members of the meat and poultry industry (packers, processors, and/or retailers) of complaints it receives from consumers about meat and poultry products. Notification will include a standard cover letter with a complaint referral form. FSIS will seek permission from the consumer to include his or her name and address with the complaint, if there is no response, the agency will forward the complaint without identifying the consumer. Details are in the Federal Register of

March 1.
(Food Technology 38(4); 1984; 49)

TOXICOLOGY AND HYGIENE

173 Mutagenic potential of heated edible oils

There is a practice of using edible oils for repeated deep fat fryin A study was undertaken to examine the possible health hazards or mutageni potential of edible oils being used after repeated heating. The most commonly used edible oils such as refined and unrefined groundnut oil, coconut oil, hydrogenated oil and unrefined safflower oil were used for this study. These oils were heated to 180 C for 6 hr for four days and ev hour, 450g of peeled potatoes were fried in each of these edible oils. Thus the oils were heated for 6, 12, 18 and 24 hrs and no fresh oil was added at anytime during the experiment. Before initiating the experiment it was ascertained that these oils were free from aflatoxins and nitrosamines which are known carcinogenic agents. Fatty acid profile was determined by GLC and iodine values were estimated.The 24hr heated oi were analysed for their mutagenic potential by the standard tests such as sister chromatid exchange (SCE), chromosomal aberrations and Ames test. the standard cytogenetic tests employed.
(Nutrition News 5(2); 1984)

174 Cod-liver oil cuts cholesterol

A daily dose of cod-liver oil may reduce your chances of developing h ease and high blood pressure. Greenland Eskimos and some Japanese, who rely on fish for most fats in their diet, suffer for less from these disorders than do people on a standard western diet. Fish contains polyunsaturated fats, which are more easily broken down by the body than the fats in meat and other western foods. Polyumsaturated fats also lower the blood's ability to clot-so much so, in fact, that Eskimos bleed more ely than other people. Now, University of Munich researchers have found that cod-liver oil added to a western diet produces similar effects. Whe volunteers stoically downed over an ounce of cod-liver oil daily for 25 days, fats in the oil were rapidly taken up by the blood, replacing those being provided by their regular meals. Not only were the subjects less

responsive to hormones that boost blood pressure, their bleeding time before clotting increased as well. These changes vanished four weeks after oil regimen ended.
(PTI Science Service 3(5), 1984; 16)

75 Tin coating of vessels helpful

The time honoured procedure in India of getting the brass utensils coated with Kallai (molten tin mixed with small percentage of other metals), prevents copper contamination of milk boiled and stored in these utensils, report Dr.B.Bhandari and Dr. B. Sharda of Ravindra Nath Tagore Medical College, Udaipur. In a recently published report, the researchers found that the copper concentration of cow's milk rises four-and-half times from 0.22 mg per litre to 0.99 mg per litre when boiled and stored for 6 hours in an uncoated brass vessel as compared to almost no rise from 0.22 mg per litre to 0.24 mg/l in Kallai (tin) coated vessel.

The tin coating (Kallai), the researchers advocate, may therefore, prove to be a life saving measure to prevent the deadly liver disease, Indian childhood cirrhosis, caused by excessive copper ingestion. in the siblings of the families whose children have died of the disease.
(PTI Science Service 3(2); 1984; 9)

76 Caffeine linked to calcium loss

Drinking three cups of coffee a day can cause the loss of significant amounts of calcium from the body, a Washington State University scientist said. Ingesting 300 milligrams of caffeine, about the amount in three cups of coffee, caused 30 milligrams of calcium loss, even in those who regularly drink coffee, said Linda Massey, associate professor of food science and human nutrition, who conducted the study with a senior researcher, Kevin Wise.

This 30 milligrams isn't very much each day, but over 10 or 15 years it can cause a problem with osteoporosis. a condition in which bones become very fragile and break easily, she said. An early sign of osteo porosis is loss of bone tissue in the jaw. Calcium is also vital for heart rhythm and muscle tone, but the researchers said the body maintain serum calcium levels well and will keep the heart working properly even when calcium is being leached from bones.
(The Hindu, July 1, 1984; 2?)

177 Newer substitutes cleansing agents

In order to improve cleansing properties of the detergents, many act ingredients such as sodium dodecylbenzensesulphonate are required. But t difficulty in the use of commonly employed surfactant is that it leads to water pollution. Phosphate builders also lead to formation of algae in ponds and streams. These algae consume greatly available oxygen in water and fishes and other creatures may not survive.

To overcome this and to remove heavy metal ions scientists of Kanpur Harcourt Butler Technological Institute reported that dextrose fatty esters do not show high detergency alone. But they found that as soon as it is used in combination with sodium dodecylbenzenesulphonate, detergenc ability is markedly improved.

The use of sugar derivatives particularly dextrose fatty esters in detergent formulation along with sodium dodecylbenzenesulphonate serves two purposes mainly. First of all it lowers consumption of the surfactant Secondly dextrose fatty esters improve quality of detergency.
(PTI Science Service 3(2); 1984; 7)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

178 Steering group for science and technology

The Planning Commission has constituted a Steering Group for Science and Technology Sector with Prof. M.G.K. Menon, as its Chairman. The Steering Group will recommend a policy framework for the S and T priorities for the Seventh Plan (1985-90).

It will review and assess the actual progress and achievements upto 1984/85 of the schemes of the Sixth plan (1980-85), especially from the view-point of need for specific mechanisms for strengthening linkages between academic/educational institutions, national and other research laboratories, industries, design/consultancy and voluntary organisation, user departments, and planning groups in the Central and State Governments and the existing organisational structures/systems especially those set up in the Sixth Five Year Plan for S and T Planning, coordination, implement monitoring and evaluation and to make specific recommendations for setting

up/to augmenting the existing structures such as S and T Division of Planning Commission; S and T cells or groups with scientific advisers at appropriate levels in administrative Ministries with S and T component and State Councils on S and T. The Steering Group has been asked to assess existing incentives amenities and facilities available to the scientific community for effective functioning and suggest further measures for improving the same. It will suggest areas of national priorities in S and T sector vis a vis, the national objectives and identify specific programmes to be implemented by various scientific organisations individually and in a co ordinated manner taking note of reports of all the Working Groups for the scientific departments/agencies/ministries with S and T components, as well as profiles available from Working Groups on the major socio-economic sectors and the methodologies and areas for setting up of new institutions and programmes in important newly emerging areas or where clear imbalances exist in the field of S and T to ensure self reliance on a long term continuing basis. The Steering Group will also recommend proper and full utilization of scientific manpower and appropriate training and retraining mechanism both within and outside the country with well defined objectives; this should include special consideration for encouragement to young scientists. The Steering Group will submit its report by May 31, 1984.
(Economic and Commercial News 14(17); 1984; 10)

India and Sri Lanka to collaborate on tea research

India and Sri Lanka have agreed to institutionalise their relationship on matter pertaining to tea for improved follow up action. Bilateral exchanges between Indian and Sri Lankan planters and research associations have been taken place earlier, however, this is for the first time that the two governments have institutionalised this relationship. From July 1984, the two countries will meet every year for discussions on research and development, the price situation and to co-ordinate their policies for this commodity. This was agreed to when the Additional Secretary, Ministry of Commerce Mr. V.C.Pande led a three member delegation to Sri Lanka recently. The leader of the delegation on the Sri Lankan side was the Secretary of the Ministry of Trade and Shipping.

Bulk packaging of tea was one of the main items for discussion and the two countries have agreed to find alternatives to the wooden tea chests which are becoming increasingly impracticable because of the lack of availability and cost of plywood. India and Sri Lanka provide nearly 50 percent of tea to the world market. The first meeting to discuss the possibilities of using multi-walled paper packing will take place in April this year in India along with the

Indian Institute of Packaging and representatives from Sri Lanka. A co-ordinated strategy will be decided so as to identify and select marke where the new packaging can be introduced for testing. The two countrie also decided to collaborate on research of tea and to select complementa areas to avoid duplication of research. It was also decided to exchange tea experts to give a new dimension to the respective country's research and development. The delegations also agreed to co-ordinate the policies their respective governments with regard to Tea Councils. The leading Tea Councils concentrate mostly on tea promotion and are located in the UK, France, Federal Republic of Germany, Canada. India and Sri Lanka felt that as producers they should play a more significant role, vis-a-vis the Tea Councils.

(Economic and Commercial News 14(7);1984; 7)

180 Comprehensive plan to develop horticulture

A comprehensive plan for the development of horticulture industry, cropwise and areawise, is proposed to be formulated and for the purpose the State Governments will be asked to acquaint the National Horticultura Board with the problems in their areas and suggest remedial steps. This was decided at the first meeting of the Board held in Gurgaon (Haryana) under the chairmanship of the Union Agriculture Minister, Rao Birendra Singh. It was decided to set up primary societies in areas of concentrat horticultural production to ensure better research, production, marketing and processing facilities for the growers. Rao Birendra Singh told the members that horticultural crops covered 11.4 million hectares representi 6.5 per cent of the total crop area in the country. Fruits and vegetable accounted for 6.2 million hectares with an annual output of 54 million tonnes. Uttar Pradesh had the largest area under fruits followed by Tami Nadu, Bihar and Andhra Pradesh. However, while a large population suffered from malnutrition and undernutrition, 20 per cent of the produce waste for want of necessary facilities. Therefore, the Minister said an all-out effort should be made to provide adequate support and infrastr cture for horticultural crops. The Board was set up in April following the recommendation of the Committee headed by Dr. M.S. Swaminathan which into the problems of horticulture industry.

(Hindu-May 16, 1984; 16)

Genetic technology centre to be in India and Italy

The world's first International Centre for Genetic Engineering and Biotechnology will be sited in New Delhi and Trieste, it has been decided in Vienna this month. Coming at the end of a plenipotentiary meeting of 25 countries of the north and south, the rollcall vote on this crucial issue represented the culmination of three years efforts to bring the benefits of this new science to developing countries.
(UN Weekly Newsletter 35(14); 1984; 1)

Agro industries body

An expert committee has been appointed by the Government to examine the setting up of a National Agro Industries Corporation, the Minister of State for Agriculture, Shri Yogendra Makwana told the Lok Sabha on 25 April.
(Jagriti 28(11); 1984; 5)

PERSONALIA

New export commissioner

Mr. Siddharth Kak, Joint Chief Controller of Imports and Exports is being appointed export commissioner. Mr. Kak succeeds Mr. M.E. Thomas who retired.
(Economic Times July 1, 1984; 1)

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A new variety of chickpea

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India reports development of a new variety of chickpea (ICCC 4) which gives improved yields, has bigger seeds, and requires less heat to cook than other chickpea varieties in Southern India. ICCC 4 has responded well to irrigation and fertilizer in tests at ICRISAT.

(League for International Food Education Newsletter 17(1); 1984; 3)

Indigenous hop oils

Studies have shown that oils obtained from indigenous hops compared well with imported hop oils for imparting an aroma and flavour to beer.

Several varieties of hops have been grown successfully in India with good yields and essential oil content comparable with the good grade varieties in the world. Hop oil whose demand is 200 tonnes per year are imported by breweries involving precious foreign exchange despite large quantities of hops being made available to the breweries by the indigenous growers. The studies were conducted by Dr A K Rishi and his colleagues at the Regional Research Laboratory, Srinagar.

The study evaluated the important volatile constituents (from the brewery point of view) of the indigenous grown hops in Kashmir valley proving the usefullness in lending aroma and hoppy flavour to beers.

Varieties of hops taken up for evaluation were Comet, Hybrid Late cluster and Talisman. It was found that the first two were found suitable following gas liquid chromotagraphy experiments.

Some of the hop oil samples were evaluated in a leading brewery for their suitability as commercial substitutes of imported oils.

Experiments indicated that Hybrid-2 and Comet have more than 30% of caryophyllene and humicelene put together indicating their suitability for imparting aromatic flavour.

(PTI Science Service 3(13); 1984; 11)

STORAGE AND INFESTATION CONTROL

186 Disinfestation of grain

The CSIRO has developed an economic and completely effective method of disinfesting grain through high temperature heat treatment. Experiments performed in a 500 kg per hour continuous flow laboratory pilot plant indica that the temperature to which the grain is heated is the single most importa determinant of insect mortality. If the grain is heated to 65 C or more, all developmental stages of insect pests (i.e. eggs, larvae, pupae and any adults that may be inside the grain kernels) are killed. The laboratory scale experiments also enabled running costs to be determined with a high degree of accuracy.

A continuous flow fluidized bed pilot plant, capable of treating up to 150 tonnes per hour of wheat, was installed at a cost of $ 500,000. It has automatic heating controls and there is no possibility of the system overheating the grain. Basically the plant, which is fuelled by liquid petroleum gas, has four main sections:a pre-heating and de-dusting chamber, a heating chamber, a heat recovery and cooling chamber supplied by atmospher air and an evaporative cooling stage.

Based on current costs of natural gas and electricity, the estimated energy cost of disinfesting one tonne of wheat could be as low as 30 cents. The capital cost of installing a 500 tonne per hour plant is currently estim at around 1.5 million dollars.

It has been shown that the heat treatment does not damage the wheat in anyway, nor change its moisture content. Samples of grain entering and leaving the plant were tested for changes in germination (a sensitive indicator of grain damage) and baking quality. As expected from laboratory trials, no changes were detected. However, further field trials are being conducted to determine the effect of the process on a wider range of quality parameters.

(Wheat Australia 17(7); 1984)

Karnataka - Apex Bank to Build 800 Rural Godowns

The Karnataka State Co-operative Apex Bank has embarked on an ambitious programme of constructing 800 rural godowns in the State within four years to store farm produce. The Rs. 28.17 crore World Bank aided project was expected to take off the ground on July 1 this year.

The bank planned to complete these godowns at 100 per year and each godown would have a capacity to store produce upto 100 metric tonnes. Construction of 96 marketing godowns also formed part of the project and the World Bank team which had made preliminary appraisal of the project, had volunteered to aid the project to the extent of 75 per cent of the cost. *(Cardamom 17(7); 1984; 9)*

Method to lengthen meat storage time

A new method of storing sensitive foods such as meat, fish and milk, based on packing them in carbon dioxide, which lengthens storage times considerably, compared to alternative techniques, has been developed by the Swedish Institute for Meat Research, Kavlinge.

The new technique exploits the fact that carbon dioxide, which is essential to all biological life, disturbs life processes if present in large quantities, different organisms being affected in different ways. For example, if meat is stored in carbon dioxide, *Pseudomonas* bacteria, which would normally quickly spoil the meat, cannot develop, while *Lactobacillus*, a type of bacteria which conserves meat, develops well.

The new method provides for meat to be placed in containers filled with carbon dioxide or in packages into which the gas is blown. At 20 per cent concentration of carbon dioxide, the growth of Pseudomonas is halted, while concentrations of 80-96 per cent are said to effectively inhibit the Enterobacteriaceae family of bacteria. *Lactobacillus*, on the other hand, is more resistant and can grow even in 100 per cent carbon dioxide.

Carbon dioxide storage of meat requires (1) high concentrations of carbon dioxide, (2) low storage temperatures, and (3) good microbiological quality at the start of storage. One of the main advantages of carbon dioxide storage, compared to other types of storage, is that the microflora is in a natural manner steered towards the completely harmless *Lactobacillus*. Another is that its

effect on bacteria is selective, while alternative methods halt all bacteri growth.

The quality of meat is, in the first place dependent on which bacteria grows in it and not on how many days it has been stored, it is said. Pork is freeze stored in carbon dioxide for 40 days, for instance, has the same quality as pork stored in air for eight days.
(PTI Science Service 3(14); 1984; 15)

FOOD ADDITIVES

189 Acesulfame K - A new nonnutritive sweetener

A new nonnutritive sweetener that holds great promise for the food ind is Acesulfame potassium salt (Acesulfame K). It has been under investigatio these last ten years at Hoechst AG in Frankfurt, West Germany. Acesulfame K is a white crystalline material that is quite stable at normal storage temperatures as well as high temperatures used in many food processes. It is not hygroscopic but has good solubility in water and produces colorless solutions when dissolved. It has a sweetness of about 200 times that of a 3% (w/w) solution of sucrose with no unpleasant aftertaste or lingering sweetne and is about half as sweet as saccharin and 4 to 5 times as sweet as sodium cyclamate.

Acesulfame K has undergone extensive toxicity and mutagenicity screening tests. In animal tests, it has been found to be virtually nontoxic, nonmutag and nonteratogenic. In human volunteers, it was found to be excreted in its original form. It was found to be rapidly absorbed and eliminated, being excreted mostly in the urine with no accumulation occurring in the serum or b tissues. Because it is excreted unmetabolized, it cannot contribute calories thus making it attractive for potential use by diabetic.

Acesulfame K's marked stability and functional properties make it an ideal component for many food products. Examples of foods that could benefit from this product include: beverages such as soft drinks, colas, fruit juices and blends, beverage emulsions, cocoa and tea, baked goods, chewing gum and b mint confections, preserved fruits, jellies, jams and marmalades, and dairy products such as yogurt, milkshake mixes, salad dressings and dips.

Acesulfame K has been approved for food use in Great Britain. In 1983 the Joint Expert Committee on Food Additives FAO/WHO evaluated and recommended that it be added to the list of safe food additives.
(Food Nutrition and Health Newsletter 8(4); 1984; 1-2)

0 GMB proteins new crumb products

GMB Proteins Ltd, the wholly owned subsidiary of Bush Boake Allen Ltd, is offering a new range of flavoured breadings for coating meat, poultry, fish and vegetables.

The initial range of flavours consists of: Barbecue, Southern fried chicken, Provencale, Lemon, Curry, Tandoori and Ham.

Extensions to the range will be available soon and will include Onion and Kentucky fried chicken flavours. The crumb texture is light and crunchy, and no special breading equipment is required for its application.

These products are a result of the development of the steam texturising technology already used to manufacture GMB's range of Bontrae textured vegetable proteins.

This process enables GMB to incorporate flavour in the crumb in such a way as to substantially encapsulate it, giving a good end flavour profile after any combination of freezing, storage, deep frying or oven baking.
(Food Trade Review 53(7); 1983; 385)

PROCESSES

)1 Bacteria destroyed by magnetism

Modular Metal Redemption Ltd of Unit C7, 426 Long Drive Greenford, Middx, has launched Algarid.

This is a device evolved from a lapsed British patent, dated 1890, and recent further research into the fact that biostatic magnetic treatment of water prevents bacteria from multiplying.

Algarid uses permanent ceramic magnets to create a magnetic field which alters the balance of the nutrients in water for algae and bacteria.

In order to grow, algae, bacteria and fungi require a balanced diet. In fact, most living things require at least 14 essential nutrients for growth. If any of these essential nutrients is missing, the consequent

trace element deficiency disrupts growth. Algarid works because the magnet field acts as a catalyst which combines one or more of the essential nutrie into a molecule which cannot be assimilated.

It is not known at this time which particular trace elements are invol because the quantities involved are too small to measure accurately.

Algarid may be used in conjunction with chlorine in applications where the amount of nutrients and bacteria present are so high that chlorine may still be required. It also reduces water hardness.

The device comes in both PVC and brass. Weighing between one and two lb, and with an outside diameter of only 1½in, nevertheless one unit can cope with a flow rate of 65 gal. per minute at a pressure of up to 160 psi.

If greater volumes need to be handled, they can be installed in series. *(Food Trade Review 53(10); 1983; 546)*

192 Techniques to reduce bacterial counts in spices

Jydsk Teknologisk Institute, 135 Marselis, Boulevard DK-8000 Aarhus, Denmark has developed a technique to reduce the bacterial load in spices such as pepper and paprika. The bacterial load of about 50 million in peppe has been reduced below 1000 per gramme by extruder cooking process. The extruder degerminate black pepper has been organoleptically tested by the expert panel and could not find any significant difference between the raw and degerminated sample. The extrusion cooking machine in the capacity of 40 kg/hour, costs 1 million Dkr. (about Rs. 10 lakhs).
(Cardamom 15(12); 1983; 15)

BYPRODUCTS AND WASTE UTILIZATION

Nil.

PROCESSED PRODUCTS

Nil.

EQUIPMENT AND MACHINERY

93 Poultry weighing and grading system

Meyn offer the poultry industry a weighing and grading system that weighs to a precision of 0.01 g. The system's overhead conveyor is equipped with simple shackles without support rollers, pivotable parts or lockable discharge mechanism. In this way mechanical defects which could cause malfunctions and faulty weighing are avoided. The birds are weighed in a 180^{o} curve of the weighing line, by lifting each shackle by means of the outer end of a balance arm which moves along with the conveyor. The stationary other end of the balance arm works in conjunction with a piezo-electric load cell, mounted in the centre of the curve of the conveyor. Since the shackles (with the birds) are completely out of contact with the conveyor when they are weighed, friction in the conveyor cannot influence the accuracy of the system. The birds are sorted by means of a mini-computer which has been programmed to grade by weight, with fixed or automatically adjusting weight limits, by quality, for special orders, according to a prescribed total weight and/or total number of birds per carton. The system may be equipped with a display unit, which constantly shows how the drop-off stations have been chosen and how many birds of each size or grade have been dropped. The same information can also be recorded by a printer. The weighing and grading system described above has recently also been introduced in the fish-processing industry.
(Industrial Products Finder 12(8); 1984; 129)

94 Meat cutting machine reduces injury risk

A meat cutting machine, which is claimed to substantially reduce the risk of injury to butchers, has been developed in Sweden by Kaarlo Korhonen and tested in the meat department of the Stockholm Cooperative Wholesale Society. Ordinarily, meat-cutting tasks involve a lot of heavy sifting and knife work, both of which are greatly minimized with the new equipment, which relieves butchers of the need to shift large pieces of meat by their own strength.

As on traditional meat cutting lines, the meat arrives hanging on a hook attached to an overhead transporter. It is then placed in the machine, a robot arm securing the Achilles' tendon and another the rump.

The butcher slices off the Achilles' tendon above the robot arm and starts the machine. While he works with his knife, clipping rather than cutting the meat, the arms slowly pull the meat away from the bone. Eventua the meat is detatched from the bone in two large pieces, which are removed on a transporter. The bone is left hanging, to be removed separately.

The machine, which is driven hydraulically/pneumatically, can be adjust laterally and for height; its robot arms are manoeuvred from a control panel

The new machine will be marketed by AB Proman of Klippan, a member of t KemaNobel group.

(Food Trade Review 53(12); 1983; 668)

195 Pneumatic conveying of powders into liquids

Neu Engineering Ltd have developed a clean method to improve the conveying and mixing of powders into liquids.

The new technique enables the powder to be pneumatically conveyed direct into the mixing vessel, so obviating the need for a filter unit, usually mounted above the mixers.

In its simplest form a typical system would comprise a pressurised air generator, a PV Rotary Air Lock to introduce the powder into the conveying line and a special diffuser situated at the end of the conveying line below liquid level.

An injection manifold device, which ensures that the powder mixes thoroughly rather than coagulates into lumps, is fitted into the line just above the mixer and diffuser. This effectively injects water into the conveying line, so 'wetting' the powder, thus ensuring rapid dispersion into the mix.

Passing conveying air through the mix also improves mixing process b creating increased turbulence and more efficient diffusion into the mix liquid.

(Food Trade Review 53(7); 1983; 372)

196 Pump for food products

Mangal Udyog have developed a pump for handling food, cosmetic and pharmaceutical products. The pump is activated by the rotation of a twin/ trilobed rotor which creates a vacuum, thus causing the liquid to flow into the pump chamber. The liquid is carried between the lobes and the pump casin

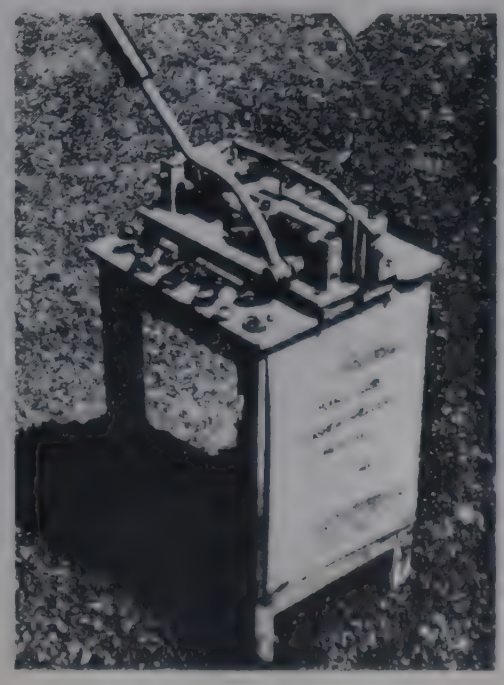
Next, the liquid is led into the other lobe chamber, and finally passed out of the pump. The pump's design reportedly ensures precise timing and eliminates any contact between the lobes. It is also suitable for handling slurries, fluids with discrete particles, and low/medium/high viscosity fluids. Products at a high temperature can be handled by incorporating a steam jacket in the pump. A removable casing cover makes for easy cleaning and inspection. The pump comes with a standard mechanical seal; while a stuffing box gland/o-ring seal is optional.
(Industrial Products Finder, 12(5); 1984; 128)

97 Peeler to save potato

Conventional potato peeling causes a loss of 20 to 30 percent of material by weight. The Aburamoto Machinery and Engineering Co. Ltd., of Toyama, Japan has a device to cut down that loss. The Model G-1 Potato Skinner developed by the company can peel potatoes with just 3-5 per cent material loss. Washed, boiled potatoes are fed into the machine while hot. The machine scrapes off the skin and delivers the potato in a minced form. The machine, weighing 400 kg, has a capacity of 700 kg per hour and requires an energy input of 0.75 kw. The machine, claimed as simple to operate and clean, has a very high collection rate (95 to 97 per cent) and does not get rusted or stained. The device could be used also for extraction of juice from berries, plums and tomatoes and removal of coverings from ham and sausage, apart from peeling of banana, and beans.
(PTI Science Service, 16(3); 1984; 16)

98 Cashew decorticator

MERADO, Cochin of CMERI has developed a unit which is capable of decorticating the cashew shells mechanically. It consists of a pair of horizontally mounted knife blades especially shaped to suit the cashew contours. It can be conveniently mounted over a table for easy operation. The unit is capable of decorticating about 10-12 kgs of cashew kernels per worker in an eight-hour shift.



Manufactured by M/s Carbide Tools India, Trichur, the decorticator is already in the market.
(CMERI Newsletter 2(2); 1984)

199 Disposable liquid posimixer

Liquid Control Ltd of Stewarts Road, Wellingborough, Northants, has introduced a range of patented disposable mixers.

Manufactured in a variety of sizes, to suit differing requirements, th Posimixer 60/40 is suitable for blending virtually any pumpable liquid. Typ applications include blending shear-sensitive materials, such as marsh-mallow, custards, sauces and fruits in yogurt; additive blending of colours and aromas in coffee extracts and citrus juices; viscous blending oils, ketchup and peanut butter; cooling of sandwich spreads and chocolate; hydrogenation of margarine. The 60/40 motionless tube mixer is designed with a series of alternating right and left hand helical elements, each one with an off-centre connection to the next element to provide an unequal 60/40 division. The materials pass through each other at each intersecting element at an unequal velocity with the effect of producing an extremely efficient mixing system.

The ¼in. and 3/4in. size Posimixers are made in a moulded engineering plastics that is resistant to most types of resin and organic solvent and, if required, they may be solvent purged for subsequent re-use. The 5/8 in. Posimixer 60/40 series in supplied in a PTFE lined metal housing and can be supplied with a varying number of internal mixing elements to accommodate high and low viscosity material applications. The mixing elements themselves are of solvent resistant plastics.

Mixer length is dependent on the number of mixing elements required. The 5/8 in. mixer has a pressure rating of 1500 psi and a temperature range of up to 180 F.

(Food Trade Review 53(12); 1983; 667)

200 Industrial mixer

Raj Machines offer the Imperator PKB industrial ing machine for bakeries; hotels; restaurants; and chemical, paint, p maceutical and ink industries. The heavy, cast iron machine frame has a built-in belt type variable speed regulator, electromotor and planetary drive unit. A mechanical timer can preset the mixing time. The bowl travels up and down o ground slides. The unit comes in 20, 30, 40, 60, 80, and 100 litre capacities, and has a stainless steel bowl, wire whip, spiral hook and beate

The SS wires of the whip are mounted in a polyamide head. The beater is cast from a high tensile aluminium alloy. The steel spiral kneading hook is reportedly unbreakable. All tools are fixed by a bayonet lock.
(Industrial Products Finder 12(7); 1984; 101)

Planetary mixer

Advani Oerlikon have developed a planetary mixer, the Model 150 H, for dry and wet mixing of powders on an industrial scale. The mixer is suitable for chemical and pharmaceutical industries: foundries and electrode manufacturing plants, etc. The unit consists of bowl, blade and hydraulic system. The latter, enclosed in the base, controls the torque and guards the mixer against overload. The bowl can be raised/lowered in hardened and ground adjustable guideways which are provided with wipers for smooth linear action. Of 130 litre capacity, the bowl is constructed such that it enables a close wiping action between the mixing blade and the bowl. Due to the direct coupling of the hydraulic drive with the hollow shaft worm reduction gearbox, three speeds (50, 160 and 210 RPM) can be achieved. The speed can be remotely regulated even when the mixer is in operation. The mixing load is indicated on the gauge.
(Industrial Products Finder 12(4); 1984; 118)

2 Bread dough mixer

The pride high-speed mixer reportedly develops bread dough within 3 min of mixing time, per batch. The dough thus mixed does not need any bulk-fermentation time and can be divided immediately thereafter resulting in higher yield per bag of flour. By the same token, weaker flour can be used. All mixing surface of the machine are of stainless steel, including bowls. The mixer stops automatically after a pre-set mixing time per batch. Mixers of different capacity are available to suit dough requirements with the biggest model giving up to 200 kg of dough, per hour.
(Industrial Products Finder 12(4), 1984, 188)

3 Multipurpose batch mixer

NVI offer a multipurpose batch mixer for mixing biscuit dough, the mixing cycle time ranging from 10 to 20 minutes. The MS mixing bowl is lined with SS. A sectional internal jacket is provided for water-cooling.

The beater speed may be 80/40 or 60/30 RPM. A two-speed main motor, depen on the capacity of the machine, is positioned at the rear of the mixer and transmits the drive through a sprocket wheel. Discharge is effected by tilting the bowl with power obtained from a separate motor which drives through a reduction gearbox and includes a braking facility. The duration and intensity of the mixing action can be controlled by a low and high spee pushbutton, or by automatic time control via an electronic process. An electric control panel achieves automatic control of the beater speed.
(Industrial Products Finder, 12(5); 1984;1)

204 Hammer Mill

Hardcase offer a hammer mill with capacities from 0.5 to 5.0 tonnes/ hour. The mill has swing type hammers rotating at 3,000 RPM, and can handle all kinds of grains and cereals, and most high density nonhygroscopic materials. The fineness of the ground material can be varied by changing the sieve mesh size. The mill is constructed from mild steel, but can also be constructed from SS to suit requirements.
(Industrial Products Finder 12(6); 1984; 33)

205 High penetration ultra violet liquid purifier

The new Sani-Matic High Penetration Ultra Violet units manufactured by the Schlueter Co will effectively purify water, liquid sugar, syrup, brine, fruit juices and other non opaque liquids.

The unique stainless steel tube assembly, containing a quartz liner and UV lamp, permits high penetration of the liquids to ensure complete destruction of harmful bacteria, viruses, protozoans and spores.

Pasteurization, chlorination or other chemical treatment equipment is not needed with HPUV. Purification of the liquid is assured by the proper dosage of UV rays, which is determined by the number of lamps and the retention time of the liquid product within the tube assemblies.

Sani-Matic units are available in capacities from 5 gal. per minute (19 litres per minute) to 200 gpm (756 1pm) from Dummann World Trade Co Inc of PO Box 18665, Milwaukee, Wisconsin 53218, USA.
(Food Trade Review 53(10); 1983; 544)

Centrifuging clarifier

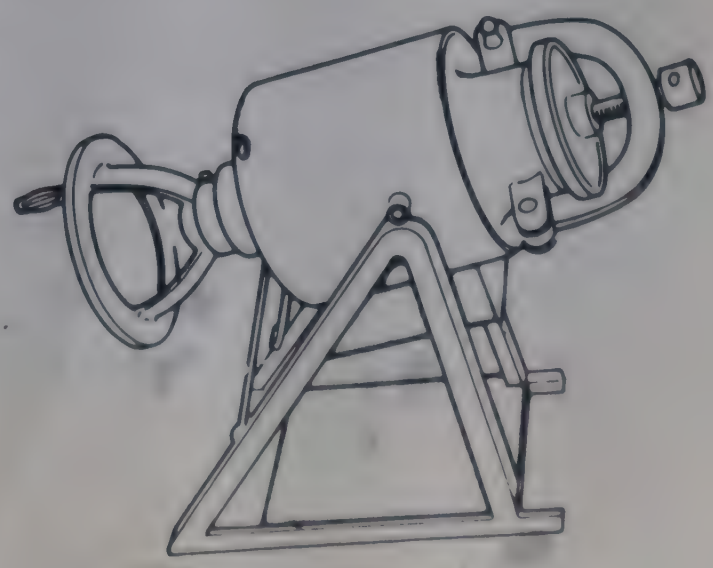
Pennwalt manufacture the Sharples Super centrifuge for separating and clarifying liquid/liquid, liquid/liquid/solid, and liquid/solid mixtures. The mixture enters the centrifuge through an inlet at the base and is fed into a hollow cylindrical rotating bowl, which has two sets of openings at the top to allow discharge of the separated liquids. The rotor turns at 15,000 RPM and generates more than 13,000x g centrifugal force, it is said. This force acts on the component parts of the mixture and separates liquids (according to their specific gravities) into concentric cylindrical layers. The lighter liquid is nearer the centre of the bowl, the heavier liquid forms the outside layer, and solids are deposited against the bowl wall. Operation is continuous, with the separated liquid being continuously displaced upwards by the incoming mixture, and discharged through the respective outlet ports at the top of the rotor. The instrument clarifies different oils such as diesel fuel, lubricating oil, cutting oil, turbine lube oil and dressing components; and finds application in industries such as pharmaceutical, food, paint and varnish, soap, printing ink, animal fat, etc.

(Industrial Products Finder 12(7); 1984;111)

7 The Puffing Gun

In this article we look at the puffing gun, a simple processing device for cooking cereals and other grains. The puffing gun provides an alternative to the long soaking and cooking times required for many legumes and could encourage people to eat more of such nutritious foods as mung beans, cowpeas and soy.

A typical puffing gun is shown Fig.1 The unit consists of a metal chamber with an easy-to-open door at one end. Moist



grain is placed in the chamber which is then rotated over an open fire. When the temperature of the chamber contents reaches the desired point, the door is quickly opened and the grain discharged into a screen or box. At the moment of discharge, the differential pressure between the steam within the grain and the ambient air causes the soft grains to expand.

A range of materials can be processed in the puffing gun, including maize (corn), rice and wheat as well as most of the common beans such as mung beans, black beans and soy.

The puffing gun is usually made of cast iron and consists of a cylinder about 14 cm in diameter by 26 cm in length with a special fast-opening door at one end. It is closed at the other end but does contain a small opening connected to a pressure guage. The entire unit is suspended so that it may be rotated by a wheel or crank attached to the closed end. Around the unit is a metal jacket to contain the heat which comes from a removable burner placed directly under the puffing gun. If the fuel used is charcoal or wood, a small blower is also provided to supply air to the burner. This is driven by a belt take-off from the main crank. The product is usually collected in a cylindrical screen about 0.5 m in diameter by 1.5 m in length placed in front of the discharge door. Alternatively, a large wooden box around 1 x 1 x 2 m may be used to collect the produce.

(Appropriate Technology 7(3); 1980; 29-30)

208 Cheese paraffining vat

DGS offer a paraffining vat for use in the manufacture of cheese. In order to develop bacterial growth and stop the effect of bacteriophages, cheese-load is dipped in molten microcrystalline wax. The standard paraffining vat is hand-operated, but mechanisation can be provided to suit requirements.

(Industrial Products Finder 12(8); 1984; 131)

209 Soya extrusion plant

Acharya offer a soya nugget extrusion plant that, besides extruding soya nuggets, is also suitable for extruding noodles, maize crunches, etc. The unit has an extrusion capacity of 5 tonnes per 24 hours, and comprises a feed hopper, a worm conveyor, a cooking chamber, an extrusion

chamber, an extrusion die, a mini-boiler, etc. The mini boiler is fitted with a 20 kw electric heating element. The plant is fitted with a 7.5 kw electric motor and operates on 440 VAC. Different sizes of extrusion dies are provided for enabling the unit to handle different material. The unit has dimensions of 2.51 x 1.2 w x 3.0 m height, and weighs 1,200 kg.
(Industrial Products Finder 12(4); 1984; 171)

0 Tea processing machine

STM manufacture the CTC Rigicut tea processing machine in 610, 760, 910 and 1,220 mm sizes, and 800, 1,000, 1,200 and 1,600 kg/hour production capacities, respectively. The machine comes in right/left hand orientation. Pitch adjustment is on a high speed roller, and is achieved by single screw axial adjustment of a precision guided independent slide. An arrangement for infinitely variable leaf fall position ensures uniform cuts with varying leaf conditions. Enclosed ceramic magnets with a swivelling arrangement for cleaning protects the segments. A synchronous microdial assembly with a backlash eliminator keeps the segment rollers in the parallel position once set. The radial adjustment is on the slow speed roller, and hence gap adjustment can be made in the running condition. The high speed roller is directly coupled with the gear box through a heavy-duty flexible coupling which also acts as a damper. The slow speed roller is coupled by a sliding coupling having uniform angular velocity. The low inclination conveyor ensures minimum roll back of leaf.
(Industrial Products Finder 12(5); 1984; 171)

1 Food processor for home-cooking

Kanekar Industries offer the Samruddhi food processor for performing a range of manual operations involved in cooking. The unit does all operations with a pair of blades and a bowl. It can grind raw and fried coconut gratings; chop/mince meat; chop greens, vegetables, fruits and nuts, knead dough for chapatis, cakes and biscuits; mix batter for idlis and dosas; evenly slice or grate cucumbers, onions, carrots etc., liquidise soft fruits and vegetables; obtain butter from curds; and make lassi. The unit can be easily cleaned and operations are performed in seconds, it is said.
(Industrial Products Finder 12(5); 1984; 99)

212 Fermenter Laboratory type

New Brunswick Scientific Company of USA have developed a compact laboratory fermenter. Cells cultivated in the fermenter are contained in a 3-12 1 stainless steel pressure vessel. Used for a range of basic and applied laboratory studies, including recombinant DNA, interferon and seed culture development, the Microgen fermenter is employed in aerobic and anaerobic investigations and for the propagation of animal and plant cell suspensions. An in-line air filter, an optional inline exhaust filter and a harvest/sampling port are steam sterilised *in situ*. It is also possible to analyse and/or control pH, redox, exhaust gases and foam formations with suitable additions to the unit.
(Industrial Products Finder 12(7); 1984; 25)

213 Evaporator for heat sensible products

Kestner of France have developed an evaporator-cum-heat pump system, the Evapac, for concentrating operations in food processing industries. Concentration can be performed at 15 to 20 C. The unit consumes 120 kWH, per tonne of water evaporated. It finds applications in concentrating the juice of pineapples, mangoes, strawberries, etc.
(Industrial Products Finder 12(9); 1984; 108)

214 Portable grain drying system

Northland manufacture a recirculating grain batch dryer operating on LP liquid gas. The dryer features a fine screen design, indicator lights for accurate monitoring, and a low HP fan.
(Industrial Products Finder 12(8); 1984; 65)

215 Solar batch dryer

A solar/biomass dryer designed and constructed by the Department of Food Science at the Universiti Pertanian Malaysia is capable of drying more than 600 kg of fish in one batch, according to department head, Dr. Mohd. Salleh Ismail. At present, the dryer is operating using rice husks as a source of energy. But a solar collector will be incorporated later so that heat from the sun can be utilised on sunny days. Consisting of

a hopper, a furnace, heat exchanger, blower and drying chamber, the dryer has three cabinets with doors at each side, capable of accommodating a total of 150 trays. Preliminary tests conducted at UPM demonstrated the dryer's capability of increasing air temperature from 29 to 35.5 C with an average velocity of 0.5 m/s. The drying time for 600 kg of fish was 14 hours.
(Fishing News International 22(9); 1983; 45)

16 Cutting fish losses with solar driers

The Bamako solar energy laboratory in the West African country of Mali is currently experimenting with six prototype fish driers.

With financial and technical support from the International Development Research Centre (IDRC), the research project aims not only to develop new drying methods but also to measure available solar energy. The director of Operation Peche, a fishery development agency financed by the European Development Fund and directed by the Malian Rural Development Department, will be responsible for promoting the use of the solar driers among the population once the experimental phase has been completed.

Several prototypes are currently under study. In the mobile drier, for example, drying takes place in a polyethylene-covered wooden shed in which the fish are placed on screens. For two days, 40 kg of fish are subjected to temperatures above 50 C. At the moment, the researchers are having trouble with the polyethylene cover because it deteriorates under the effect of the sun's ultraviolet rays.

Other prototypes resemble wooden cases equipped with screens and adjustable shutters to control airflow. The fish are subjected to a current of hot dry air which circulates between the shelves by simple convection. This drier costs less than the polyethylene covered shed (90,000 Malian francs instead of 130,000) and can dry 15 kg of fish in two days.

Other more sophisticated driers are also being tested. These include a model with a capacity of 50 kg, equipped with nine solar collectors for a total surface of 14 m^2. It dries the fish in 24 hours.
(Invention Intelligence 19(2); 1984; 62-63)

217 Freeze dryer.

Edwards manufacture a package freeze dryer for medium scale productic The dryer uses AISI 304 stainless steel for all parts that come in contact the product. The sandwich construction shelves are cooled and heated by t same low-viscosity type diathermic fluid. Minimum and maximum shelf tempe are -50/55 C and +70 C, respectively. The shelf thermoregulator range with concurrent use of condenser is -10 C to +70 C (with dual purpose compresso and -40 to +70 C (with additional compressor). Temperature accuracy is ±1 Twin semihermetic fluid pumps help circulate the diathermic fluid. *(Industrial Products Finder 12(4); 1984, 81)*

218 APV spiral freezing system

A new, totally enclosed rapid freezing unit, designed, developed and manufactured by APV Parafreeze Ltd of Stephenson Way, Thetford, Norfolk, th Spiraflex, is now on the market, and the first one is already installed and working at Wall's Southall factory in West London.

The new concept in spiral freezer design incorporates a unique method driving the flat product carrying belts by rotating bobbins situated around circumference of the belts inner edge at each end of the oval shape.

This method of drive allows the evaporator to be situated within the ce of the spiral configuration which in consequence, provides a more even air distribution, and the resulting compactness of the design means the use of less floor space.

Freezing times are reduced due to this improved cold air flow. The fle of the design allows the driven bobbins, which hold the layered stainless st meshed belts that spiral around the evaporator, to be adjusted according to product height (maximum 100 mm). Spacers can be positioned between the bobb to adjust the gaps between the belts.

Because the number of elongated tiers is fewer in number than the norma spiral freezer, the headroom is much lower. The vertical drive shafts, whic hold the series of bobbins, are driven by a variable speed gearbox by chains each end of the elongated tracks from above the cabinet. This permits mainte work to be undertaken outside the cabinet freezing or cooling chambers.

The centralised refrigerator system, which is surrounded by the product the moving belt, meets a consistent stream of turbulent air that gives rise t heat transfer rates than those achieved in the conventional system. The syst does not need defrosting between each shift and at the end of the day the bel

is automatically fed through a simple spray cleaning unit.

The enclosure cabinet is manufactured from insulated prefabricated panels which are laminated with plastics to form a non corrosive vapour barrier. Conveyor steelwork is galvanised and conveyor runners are fitted with Nylatron wear strips for quietness and smooth running.
(Food Trade Review 53(9); 1983; 497)

19 Conveyor dishwashing machine

The Teco single tank conveyor dishwashing machine model CDW-1 is for hygienic washing of dishes, particularly steel compartmental thalis in industrial canteens. Its capacity is 200 racks per hour-3,500/4,500 mixed crockery/glasses/cutlery or 1,200/1,600 steel compartmental thalis, per hour. Conveyor motor is 440 V/3 ph/0.5 HP, and pump motor 440 V/3 ph/2 Hp and tank heating 440 V/3 ph/13.5 kw. In the dishwashing sequence, soiled ware is brought to the dishlanding table where left over food is scraped away and the ware sorted into suitable dishracks. After a prewash spray over a sink the rack is pushed on to the conveyor chain of the diswashing machine. Dishes are subjected to a powerful detergent spray from top and bottom for thorough cleaning As the rack is carried forward it actuates a switch to activate a sanitising final fresh water spray from a separate water heater. Also manufactured are stationery type dishwashing and glass washing machines.
(Industrial Products Finder 12(4); 1984; 187)

220 Dishwashing machine

Lance conveyor type dishwashing machine has been designed for hygienic washing of melamine, crockery and stainless steel ware. The machine comes in lengths of up to 9.75 m, and incoporates loading zone, four washing chambers, drying chamber and unloading zone. The dishes move on a conveyor and pass through the rinsing, detergent washing, final rinsing sterilising and drying chambers. The photocell automatic stopping arrangement prevents dishes from getting carried over and broken. The heating arrangement is provided by steam or electric heaters. Throughout

the washing process, the dishes are not touched by hand. The washer finds applications in flight kitchens, five star hotels, industrial canteens, etc *(Industrial Products Finder 12(9); 1984; 85)*

221 Automatic powder filling machine

APM manufacture the Auto-Fill PF-90 fully automatic machine for filling powder into cans or bottles. The machine comes with a single (30/40 containe min output), or twin (60/80 containers/min output), filling heads, and works on a no-container-no-fill system. Also available is a semi-automatic version in which bottles/cans have to be fed manually. The latter has an output of 20-25 bottles/cans, per minute. Both versions find applications in filling powders such as tooth and talcum powders, tea, coffee, pharmaceut food products, etc.
(Industrial Products Finder 12(7); 1984; 57)

222 Accurate water quality control

Signet Scientific Company's new Mk 810 conductivity controller and Mk 82 resistivity controller are described as accurate and economical microprocesso based instruments designed to measure, record, and control water quality in a wide range of industrial and commercial applications.

Measurement functions are presented on a large three-digit LCD display i one of three broad scale ranges that are easily accessed through pressure sen front panel switches.

Precision temperature readings are ensured by the unit's unique micropro ssor-based temperature compensated circuitry. For truly accurate measurements the microprocessor contains the exact temperature curve to normalise readings a specific conductivity.

A temperature coefficient switch on the conductivity controller allows th operator to adjust the slope of the curve. The resistive controller provides automatic adjustment and display of the temperature coefficient through a similar switch.

Control features in these units include adjustable high low alarm set points and a 420 m A signal that is available to drive a recorder or other equipment in addition a special "acknowledge" switch permits the alarm relays to be disengaged during an alarm condition.

Both are available in standard polypropylene and high temperature PVDF versions, and feature a built-in temperature sensor for improved linearity. *(Food Technology in New Zealand 19(2); 1984; 43)*

23 Moisture controlling units

Dry-Air offer a range of moisture controlling equipment including dehumidifier. The dehumidifier removes moisture from air with an adsorbing desiccant. It comes in 23 standard sizes and finds applications in pharmaceutical and food processing industries.
(Industrial Products Finder 12(4); 1984; 77)

PACKAGING

24 Shrink packing machine

Perks Engineering manufacture a shrink packing machine which uses a heat shrinkable polymer film for packing purposes. The polymer is wrapped around the product to be packed, and shrunk by the application of heat, to give a skin-tight, transparent packing. The packing is moisture, dust and pilfer proof. The machine finds applications in packing food and frozen food products, cutlery, etc. The machine handles products of weights up to 65 kg, and sizes from 7.62 x 7.62 cm to 91.44 x 60.96 x 30.48 cm. The machine comes in a production range offering one pack per minute, on manually operated models, to 10/12 packs per minute, on fully automatic versions.
(Industrial Products Finder 12(5); 1984; 107)

25 Packaging machine

Nichrome manufacture the Autowrap automatic vertical form, fill, seal machine for packing products in pillow type pouches. The modular constructed unit is controlled by a digital logic programmer. The machine, which can handle heat sealable single layer films of LDPE, HDPE, polypropylene or multi-layer laminates with heat sealable inside layers, comes in four models. The laminate, in the form of layflat roll, is mounted on the machine. Film is drawn on different rollers, pulled over a forming shoulder, and wrapped around the forming tube. Vertical seal takes place on the sealing jaws provided in overlap, reverse or serrated seal fashion; while the horizontal jaws fitted

on reciprocating table pull the film and seal the tube horizontally. Bot vertical and horizontal seals are actuated by a hydraulic system. The product is fed through the forming tube in the half-formed bag, and the same is sealed from the top and cut to length in a parallel action, with simultaneous bottom sealing of the next bag. The bag width can be adjuste from 60 to 250 mm via forming shoulders, and length is continuously adjustable from 60 to 400 mm, depending on the model. Different filling devices to suit the products can be synchronised with the machine. Attachments include volumetric, piston, paste and cup fillers; auger; buck elevator; gas and washing arrangements; air removal device; photo sensor; pouch carrying conveyor; etc.

(Industrial Products Finder 12(9); 1984; 55)

226 Container side seam welder

Mechelonic offer a seam welder for the welding of tin sheets in container manufacturing. The equipment also welds black sheets, tin-free sheets (TFS) and stainless steel sheets. Materials of 0.2 to 0.5 mm thickness for cans of 52 to 132 mm dia and 130 to 450 mm length can be welded on this machine at speeds ranging from 5 to 25 metres, a minute. The main transformer, variable speed driving system, wire reservoir, control system, etc. are enclosed in the main frame and are accessible for servicing. Carriage is adjustable for different container lengths mounted with an antifriction bearing assembly on the lower arm. Built-in pneumatic clamping device to hold the sheets in place before and during welding is provided. Automatic cut off is by precision limit switch operation. Different arm sizes of carriages are available to match the different arm sizes. An automatic fly-start system, maintains the normal welding speed from the initial start. A fully solid-state welder control incorporating thyristors permits uniform weld quality. A two-stage heat control unit controls the intensity of the weld current at the beginning and at the end of the weld.

(India Exports Newsletter 6(11); 1983; 23)

27 Biscuit packing machine

Nichrome manufacture a fully automatic/mechanically operated machine for packing biscuits in wax-coated papers. The number of biscuits per pack (from 4 to 13) and the shape (square/round) can be adjusted to suit requirements. Biscuits are automatically drawn from a conveyor and wrapped by wax-coated paper (which is drawn from the reel and cut to size). A photosensing arrangement facilitates the use of printed papers. The wrapped packet is further sealed by electric heaters. The speed of the machine is adjustable between 25 and 60 packs per minute. The machine operates on a 1 HP motor and has 1.5 kw heating power at 440 v, 50 Hz supply. The unit measures 4 x 2 x 1.5 m. Different safety features ensure safety of operations.
(Industrial Products Finder 12(6); 1984; Cover page)

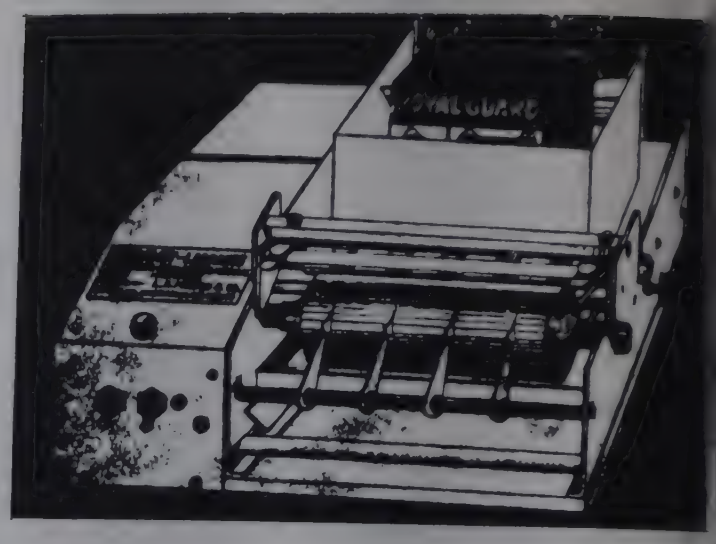
28 Biscuit wrapping machine

Khosla Engineers manufacture the OW 21 wrapping machine for wrapping biscuits, soaps, etc. with wax paper or heat sealable films. The machine can accommodate packet length variations of up to 5 mm, and can wrap up to 80 packets per minute. Also available are optionals such as a belt feed system from where biscuits are automatically counted and fed into the machine.
(Industrial Products Finder 12(7); 1984; 111)

29 S.S. Bottle de-labeller and washer

Purpose built for use on returnable beer and soft drink bottles, this washing and de-labelling machine from Britain is said to satisfy the need to redu water heating costs and to make cleaning and maintenance as easy as possible. Of stainless steel construction, it has double skin panels (to cut heat loss), and features smooth surfaces and radius-sued corners to facilitate cleaning. Models are available to handle between 4,800 and 60,000 bottles an hour. Pre-rinse and pre-soak stages can be included, if required, and bottles can be rinsed in hot or cold water according to the finish required.
(Industrial Products Finder 12(7); 1984; 101)

230 Label pasting machine



Shree Vihot Engineering Works of Ahmedabad have developed the Lab-Paste auto label pasting machine for use in pharmaceutical industries, distilleries and breweries, chemical units, perfumeries, etc. The lightweight machine features automatic feed facility; adjustable output rate up to 70 labels, per minute; single delivery device, 150 mm glueing roller width, etc. The unit is suitable for single phase, 220 VAC input, and consumes 40 W.
(Industrial Products Finder 12(8); 1984; 75)

231 Plastics containers for deep freeze applications

A range of plastics containers, specially developed for deep freeze uses, has been introduced into the UK by Perstorp Form of 97 High Street, Marlow, Bucks SL7 1AB.

They are made from high density green polyethylene and will withstand temperature extremes of - 40 C to +90 C. Desigred to fit Euro-size pallets, the containers have good stacking characteristics with strong handgrips. They are light, yet will take rough handling.

Three sizes are available, 22, 27 and 33 litres. For each size there is the option of perforated sides and base, or perforated sides and solid base.
(Food Trade Review 53(12); 1983; 680)

ANALYSIS

232 Portable smokemeter

A portable smokemeter model GSM 101 has been developed for maximum simplicity in use and minimum maintenance requirements.

With this meter reasonable smoke limit could be established by any service centre, garage, establishment and industry using diesel engines, generators and vehicles where smoke is to be reduced so that positive benefit could be realised financially and environmentally.
(India Exports Newsletter 6(11); 1983; 24-25)

Bactomatic launch bactometer

Bactomatic Ltd of 1 Newtown Industrial Estate, Newtown Road, Henley-on-Thames, Oxon RG9 1HG, has introduced into the UK and European markets a new automatic Microbial Monitoring System which provides test results in hours rather than days.

The shorter laboratory time associated with the use of the new Bactometer model 123 system allows the user to screen raw materials prior to processing, release finished products earlier for shipment, reduce stock levels and subsequent warehousing requirements, and improve hygiene controls.

Model 123 is a computer assisted instrument capable of testing up to 512 samples simultaneously. It has the facility to measure conductance, capacitance or impedance changes in the samples under test, allowing the user to select the most appropriate measurement for each specific testing requirement.

(Food Trade Review 53(10), 1983; 543)

Rennet or Pippin Apple and Lady-Apple

Can one separate fruits rapidly according to their colour, i.e, according to their degree of maturity? A tri-colourimetric system has just been developed by a team under Prof. Bruel (Higher National School of Electrical Technology, Electronics, Information and Hydraulics at Toulouse) with the help of the ANVAR. The system prepares a histogram, centred on one colour, of the surface of the fruit, after analysing the surface of a standard (or reference) fruit. The fruit will be accepted or rejected according to the shape of this histogram (Lettres des Sciences et Techniques, 1983, 4.45/46).

It is now possible to screen, in real time, 5/10 objects per second, with a margin of error of 5%. More aestheticism, or real progress? For, the relation between colour and maturity of a fruit is not always perfect.

(La Recherche, March 1984, No. 153, 369)

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIALS)

235 Oilseed production 1982-83

	Area '000 ha	Production 1000 tonnes
Groundnut	7,345.2	5,552.7
Castorseed	570.2	345.0
Sesamum	2,780.1	502.2
Rapeseed & Mustard	4,194.2	2,472.3
Linseed	1,758.3	475.8
Safflower	755.1	371.5
Nigerseed	500.8	118.1
Sunflower	430.7	224.7
Soyabean	767.9	490.9
Total	19,102.5	10,553.2

(Agricultural Situation in India 38(8); 1983; 612)

236 Production of fruits in India

(Thousand tonnes)

	1974-76	1980	1981	1982
Mangoes	7333	8363	8516	8500*
Bananas	3480	4830	4500*	4724*
Oranges	937	1160*	1180*	N.A.
Apples	477	719	822	850*
Pineapples	420	549	513	613*

* FAO estimates

237 Copra crisis

World copra production is expected to fall from 4.6 million tonnes in 1982/83 to 4 million in 1983/84, the lowest for 10 years.

The Philippines, a major exporting country, was particularly affected and as there is a lead time of 14 or 15 months for this to be reflected in exports, coconut oil and meal exports are expected to fall sharply in the January/September period of 1984.

The drought in Indonesia and India last season led to a shortfall in their domestic crops and forced Governments to raise imports.

World coconut oil production is expected to fall by 230 000 tonnes to 1.8 million tonnes and world coconut oil exports by 150 000 tonnes to 828 000 tonnes in the January/September period this year.

Philippine coconut oil exports were unexpectedly large in October/December 1983 due to domestic stock reductions, but exports over the whole of this season are expected to fall to 880 000 tonnes from 978 000 tonnes last season.

The Indonesian Government banned indefinitely copra and coconut oil exports in August 1983, and domestic coconut oil production is expected to fall to 533 000 tonnes this season from 606 000 tonnes in 1983.
(Asian Agribusiness 1(3); 1984; 10)

238 Coffee production

Coffee production estimates for 1983/84 (October-September) have been scaled down first from 1.70 lakh tonnes to 1.40 lakh tonnes and later to 1.20 lakh tonnes. Industry circles place the production figure at well below one lakh tonnes. However, 1984-85 is going to be an year of bumper crop with a likely production of 1.70 lakh tonnes.

India's coffee exports

Fiscal Years	Quota Countries	Non-quota Countries
	% to Total	% to Total
1980-81	46.9	53.1
1981-82	63.2	36.9
1982-83	55.9	44.1

(Southern Economist 23(4); 1984; 28)

239 All time high fish production

Preliminary reports reaching the Union Agriculture Ministry indicate an all-time high production of 1.60 million tonnes of marine fish landings during 1983-84. This amounts to a quantum jump of 11 percent over the year 1982-83, when the production stood at 1.44 million. The highest marine fish catch of 1.55 million tonnes was recorded in 1980. The reasons for increase in marine production over the years have been the improvement in the deep sea and inshore mechanised fishing fleet and berthing and landing facilities for fishing vessels. The increase in 1983-84 may as well be ascribed to the better fishing season for offshore pelagic fisheries. *(Economic and Commercial News 14(24); 1984; 11)*

PRODUCTION (INDUSTRIAL)

240 Sugar production

The total production during first nine months of the season 1983-84 is 58,57,000 tonnes as against 81,78,000 tonnes during the corresponding period last year.

The total closing stock of sugar with the factories as on 30.6.84 was about 43,64,000 tonnes as against 65,40,000 tonnes on the same date last year.

(Indian Sugar Mills Association - Press release)

EXPORTS

241 Exports of fruits and processed products from India

(Rs. in lakh)

Item	1981-82	1982-83*
Fresh mangoes	349	700
Other fresh fruits	394	470
Mango juice	499	3950
Other canned & b. fruits	1639	580
Pickles and chutney	611	680

* Target

(Economic Times July 18, 1984; 5)

Need to maximise solvent extraction from groundnut oilcake

Mr. S.B. Jhaveri, Chairman of the Groundnut Extractions Export Development Association, told pressman here on Friday that exports during 1983-84 totalled 2.90 lakh tonnes valued at Rs. 43.3 crores for vis-a-vis 2.44 lakh tonnes valued at Rs. 33.25 crores during the previous year, an increase of about 46,800 tonnes or Rs. 10.13 crores

(Hindu August 12, 1984; 6)

High-grade cardamom exports to Iran and Kuwait

Under two recent contracts, India will export 125 tonnes of high-grade cardamom to Iran and Kuwait. These are the largest export orders booked this year and have been specifically undertaken to ensure India's presence in the international market. These are in addition to 300 tonnes of cardamom which has already been exported to Saudi Arabia this year and 80 tonnes committed for export to USSR. The State Trading Corporation of India has procured quality cardamom through the Kerala Marketing Federation for export to Iran and Kuwait.

(Economic and Commercial News 14(22); 1984; 2)

Export of cardamom oil

Year	Qty. (Kgs)	Value (Rs.lakhs)	U. Value (Rs. / kg.)
1980-81	919.0	15.71	1710
1981-82	755.0	13.71	1816
1982-83	447.5	8.53	1906

(Cardamom 17(6); 1984; 5)

Cashew export

India's export of cashew kernels during the calendar year 1983 registered a 12.3 percent increase. During the year, exports amounted to 35,697 tonnes as compared to 31,787 tonnes in 1982. The increase was mainly due to our competitive and lower unit export price which in 1983 averaged only Rs. 38.57 per kg. The comparative unit export prices in 1982

and 1981 were Rs. 47.42 per kg and Rs. 58.39 per kg respectively. Thus, despite the increased export, the earnings realised during 1983 were less at Rs. 137.71 crores, a fall of 8.6 percent over the previous year's earni of Rs. 150.74 crores.
(Cashew Bulletin 21(2); 1984; 3)

246 Plan to boost exports of farm items including cashew

Government has chalked out an ambitious plan to boost agricultural exports by a minimum 15 percent annually. The plan envisages setting up of a Board for the exports of value added items by means of brand marketing reduction of duty on the import of machinery for the processed food industr cash assistance for packaging and setting up captive farms for export of meat and other products. In the current budget, the Finance Minister has announced reduction of import duty for packaging machinery to 40 percent.

Products identified as a value added items for export in consumer packs with separate brand names are processed cashew, HPS groundnuts, tea, spices, coffee, buffalo meat, fruits and vegetables, etc. It was pointed ou that by better packing and processing of these products, the country could realise at least 200 to 600 percent more.
(Cashew Bulletin 21(3); 1984; 10)

247 Labelling and marking requirements.

The Japanese Ministry of Health and Welfare has given notice that it intends to require all domestic food manufacturers and importers to include the chemical names of all food additives on product labels. There will be a two year grace period before such regulations are introduced. At present, the regulations require only that the purpose of the additive be stated (e.g artificial sweetener, synthetic colouring or preservative) and then only for a list of 68 chemically synthesised food additives out of a total of 347 app oved synthetic and 700 natural additives.
(India Exports Newsletter 6(11); 1983; 23)

248 Marine exports touch new height

The exports of marine products from India is estimated to have reached a level of Rs. 3600 million in 1983-84. The average unit value realisation of exports of marine products in 1983 was at Rs. 42,180 per tonnes.

The Commerce Ministry has taken a number of steps to improve marine products export including chartering of foreign deep sea fishing vessels, promotion of prawn farming, joint ventures for deep sea fishing, diversified fisheries, improvement in fishing gear and craft, modernisation of processing plants and encouragement for value added items. Marine products have been brought under compulsory quality trial and preshipment inspection. As a result, the quality of marine products has registered an improvement.

Two frozen storages, one at Cochin with a capacity of 500 tonnes and other at Calcutta with a capacity of 300 tonnes, have already been constructed at ports for the pre-shipment storage of frozen cargo. Dry fishing storage at Tuticorin has also been completed. Furthermore, Rs. 23,00,000 have been disbursed as subsidy for upgradation of 360 peeling sheds. Under the scheme of subsidy for establishment of mini-laboratories, 25 sea-food processors have been granted a total subsidy of Rs. 8,88,000. A new scheme for establishment of joint mining laboratories with a subsidy from MPEDA has also been approved by the Commerce Ministry.

Apart from these measures already taken to develop and promote exports of marine products, MPEDA has proposed subsidy schemes linked to export production of various items of marine products to be introduced during 1984-85.

These schemes are likely to give a new orientation to the activities of the MPEDA during the Seventh Five year Plan. The schemes envisage subsidies for out-board motors, fuel saving devices and squid jigging equipment; and modernisation of shrimp processing plants through subsidies for modern plate freezers, ice making units, IQF units, transport refrigeration units, generators, etc. As many as 29 items of marine products are exported from India. Frozen shrimps continue to dominate India's export basket of marine products and accounts for nearly 70 percent of the total exports in terms of quantity and about 90 percent in terms of value. The other major items of marine products being exported are frozen cuttle fish and fillets, dried fish and, fresh and frozen fish.

Japan continues to be the principal market for India's marine products followed by USA. During 1982-83, Japan accounted for 53 percent of India's total exports of marine product in terms of quantity and 73 percent in terms of value. Other important markets for India's marine products are UK, Kuwait, Netherlands, Singapore, France, Belgium, Sri Lanka and Australia. *(Economic and Commercial News 14(23); 1984; 6)*

249 Export of pesticides

Quantity in Kgs
Value (FOB) IN '000 Rs.

Item	1980-81		1981-82	1982-83
	Quantity	Value	Value	Value
Nicotine Alkaloids	1000	85.4	-	-
Nicotine Sulphate	273735	7247.7	13392.8	15130.7
Salt & Derivaties of Nicotine	147	9.6	-	-
BHC Dust	55000	76.8	-	-
DDT	27000	92.0	-	-
Aluminium Phosphide	103167	8053.5	5567.3	9380.7
Lindane	13750	1128.6	-	-
Pesticides Others	193476	1650.0	-	-
Fungicides Others	108300	426.2	8058.0	14803.0
Insecticides Others	117286	724.0	-	-
Zinc Phosphide	127400	2681.2	3546.8	2810.3
Other Phosphides	100	8.0	-	-
Sulphur Excluding Sublimed	211700	449.2	-	-
Total	-	22632.2	30564.9	42124.7

(Pesticides Information 9(4); 1984; 39)

250 Import of edible oil

During the last three years the value of imports of edible oils made by the State Trading Corporation is as follows:

Financial year	Value (cif) Rs. in Crores
1979-80	610.48
1980-81	527.80
1981-82	498.36

These edible oils were purchased from USA, Europe, Brazil, Malaysia and Indonesia.

(Oils and Oilseeds Journal 35(4/5/6); 1982; 37)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

REGULATION

Export Policy of Meat of culled Buffaloes, meat of Indian Sheep and meat of Indian Goat

Attention is invited to Export Policy of meat of culled Buffaloes, meat of Indian Sheep and meat of Indian Goats as indicated under S.No. 6 of the Policy Statement of Import and Export Policy, 1983-84 (Vol II).

2. In order to ensure that only meat conforming to health standard is exported, it has been decided to introduce compulsory Quality Control Pre-shipment inspection, in respect of meat of above animals.

3. Accordingly the following amendments to the Export Policy shall be made in the Policy Statement of Import and Export Policy, 1983-84 (Vol.II).

(1) Under S.No. 6(b) after condition No. (v) in Col. 3, the following shall be added:-

(vi) 1. Export of chilled/frozen meat shall be allowed on furnishing pre-shipment inspection certification issued by the office of State Directorate of Animal Husbandry or any other Veterinarian authorised on their behalf to the effect that:-

1. The meat has been obtained from healthy animals slaughtered in licensed premises and subjected to ante-mortem and post-mortem inspection according to the prescribed procedures.
2. The meat has been prepared under hygienic conditions, wholesome and fit for human consumption.
3. The meat is free from parasitic infestation.

(vii) Export of Frozen meat shall be allowed from Bombay, Delhi and Mangalore on furnishing further pre-shipment inspection certificates issued by Director of Animal Husbandry, State Governments or any other officer authorised on his behalf. In case of all exports from Cochin and Madras the inspection would be by Export Inspection Agency Cochin and Madras respectively.

The certification would be to the effect that:-

1. The meat/carcass shall be free from pathogenic micro-organisms.
2. The meat/carcass shall conform to the following bacteriological quality.

specifications:-

(1) Total Bacterial count shall be within limit of 1 to 10 million per gram.

(2) *E.Coli* bacterial count shall be within limit of 100 to 1000 per gram.

(3) It shall be free from *Salmonella*.

(II) Under S. No. 6(c) after condition No. (iv) in col.3, the following shall be added:-

(v) Export of chilled/frozen meat shall be allowed on furnishing pre-ship inspection certificate issued by Directorate of Animal Husbandry or any other veterinarian authorised on their behalf to the effect that:-

(1) The meat has been obtained from healthy animals slaughtered in licensed premises and subjected to ante-mortem and post-mortem inspection according to the prescribed procedures.

(2) The meat has been prepared under hygienic conditions, wholesome and fit for human consumption.

(3) The meat is free from parasitic infestation.

(vi) Export of frozen meat shall be allowed from Bombay, Delhi and Mangalore on furnishing further pre-shipment inspection certificates issued by Director of Animals Husbandry, State Governments or any other officer authorised on his behalf. In case of all exports from Cochin and Madras, the inspection would be by the Export Inspecti Agency Cochin and Madras respectively.

The certificate would be to the effect that:-

(1) The meat/carcass shall be free from pathogenic mi ro-organisms.

(2) The meat/carcass shall confirm to following ba riological quality specifications:-

(1) Total Bacterial count shall be within limit of 1 to 10 million per gram.

(2) *E.Coli* bacterial count shall be within limit of 100 to 1000 per gram.

(3) It shall be free from *Salmonella*.

4. As regards meat of culled buffaloes, similar condition mentioned in paragraph 3 above, has been incorporated under OGL/3 vide Exports (Control) Amendment Order No. L(C)O, 1977/AM (278) dated the 1st December, 1983.

5. In respect of meat of culled buffaloes meat of Indian Sheep, meat of Indian Goat, the above provisions shall not be applicable in respect of the consignments where the shipping bills have already been passed by the Customs authorities within three days from the date of issue of this notification. In such cases all conditions existing prior to this notification shall continue to be applicable.

Sd/-
(P.C.JAIN)
Chief Controller of Imports & Exports

(India Exports Newsletter 6(11); 1983; 15-16)

2 Export Trade Control Order (25th amendment order 1983)

No. E(C)O 1977/AM (278):- In exercise of the powers conferred by Section 3 of the Imports and Exports (Control), Act, 1947, (18 of 1947), the Central Government hereby makes the following order further to amend the Exports (Control) Order, 1977, namely:-

1. This Order may be called the Exports (Control) Twenty fifth Amendment order, 1983.
2. In the Exports (Control) Order, 1977, in OGL-3, in Schedule III, in Col.4, the existing condition shall be renumbered as (i) and the following shall be added thereafter as condition No. (ii) against S.No. 3:-

"(ii)Export of Chilled/frozen meat shall be allowed on furnishing pre-shipment inspection certification issued by the office of the State Directorate of Animal Husbandry or any other Veterinarian authorised on their behalf to the effect that:-

1. The meat has been obtained from healthy animals slaughtered in licensed premises and subjected to ante-mortem and post-mortem inspection according to the prescribed procedures;
2. The meat has been prepared under hygienic conditions, wholesome and fit for human consumption;
3. The meat is free from parasitic infestation;
4. Export of frozen meat shall be allowed from Bombay, Delhi and Mangalore on furnishing further pre-shipment inspection certificates issued by Director of Animal Husbandry, State Government or any other officer authorised on his behalf. In case of all exports from Cochin and Madras the inspection would be by Export Inspection Agency, Cochin and Madras respectively. The certification would be to the effect that:-

1. The meat/carcass shall be free from pathogenic micro-organism.

2. The meat/carcass shall confirm to bacteriological quality specifi

   (i) Total bacterial count shall be within limit of 1 to 10 million per gram;

   (ii) *E.Coli* bacterial count shall be within limit of 100 to 100(per gram; and

   (iii) It shall be free from *Salmonella*".

Sd/-
(P.C. JAIN)
Chief Controller of Imports & E

(India Exports Newsletter 6(11); 1983; 19)

253 Export Trade Control Order (26th amendment order 1983)

No.E(C)O, 1977/AM (279):- In exercise of the powers conferred by Secti of the Imports and Exports (Control) Act, 1947, (18 of 1947), the Central Government hereby makes the following Order further to amend the Export (Co Order, 1977, namely:-

1. This Order may be called the Exports (Control) Twenty sixth Amendme Order, 1983.

2. In the Exports (Control) Order, 1977, in OGL-3, in col.4 against S.N the following shall be added after condition No. (ii):-

"(iii) -- Quarantine of Buffaloes for a minimum period of 21 days during which period the buffaloes will be subject to inspe and vaccination for rinderpest, foot and mouth disease and also be tested for Tuberculosis and Brucellosis".

Sd/-
(P.C.JAIN)
Chief Controller of Imports & Export

(India Exports Newsletter 6(11); 1983; 20)

254 Furnishing amount of CCS claimed

Attention of the trade is invited to Column 3(c) of the Application mean for claiming CCS under SPS and column 8(e) in the application meant for CCS u normal procedure Sub-item (c) and (e) referred to above may be further divided into (i) & (ii) against which amounts of CCS claimed should be indica

both in figures and in words respectively.

Wherever the above information is not furnished in full, such applications will be rejected.

(India Exports Newsletter 6(11); 1983; 20)

Export Policy of Live Buffaloes and Live Sheep during 1983-84

Attention is invited to export policy of Live Buffaloes and Live Sheep as indicated against S.No. 2 and 3 of the Policy Statement at page 3 of Import and Export Policy April, 1983--March, 1984, (Vol II).

2. In order to ensure that only healthy animals are exported it has been decided that Live Sheep and Live Buffaloes before actual export, will be kept in Quarantine for a minimum period of 21 days during which period the animals will be subjected to inspection and vaccination. During this period the Sheep will be vaccinated for Rinderpest, Foot and Mouth disease and Sheep pox. Similarly, buffaloes will be vaccinated for Rinderpest, Foot and Mouth disease and will also be tested for Tuberculosis and Brucellosis.

3. Accordingly in col.3, against S.No.3 of the Policy Statement at page 8 of Import and Export Policy Book 1983-84 (Vol.II) the following sub-condition No. (iv) shall be added:-

"(iv)- Quarantine of Sheep for a minimum period of 21 days during which period the Sheep will be subjected to inspection and vaccination for Rinderpest, Foot and Mouth disease and Sheep Pox".

4. As regards export of Live Buffaloes, conditions mentioned in paragraph 2 above have been incorporated in OGL-3 vide Exports (Control) Amendment Order No.E (C)O, 1977/AM(279) dated the 1st December, 1983.

5. The following procedure will be followed for export of Live Buffaloes and Sheep:-

(i) Export of Live Buffaloes and Sheep shall be allowed from Bombay and Kandla ports only.

(ii) The Quarantine would be done under the overall supervision of Government of India. The Director of Animal Husbandry, Maharashtra

any other officer authorised on his behalf for Live Buffaloes and Sheep intended to be exported from Bombay and the Director of Animal Husbandry, Gujarat or any other officer authorised on his behalf for Live Buffaloes and Sheep to be exported from Kandla port respectively are authorised to issue a certificate on behalf of Government of India in respect of quarantine, before export of live animals is allowed. Director, Department of Sheep and Wool Rajasthan would issue certificate in respect of sheep put up in quarantine within the State of Rajasthan.

(iii) The exporters interested to export Live Buffaloes and Sheep would offer premises for purpose of quarantine. The premises would be inspected by the State Directors of Animal Husbandry and Veterinary service for the purpose of Infrastructure facilities and after examination of the premises, the same will be declared as approved quarantine stations for the purpose of undertaking quarantine prior to export.

(iv) All animals subjected to quarantine would be identified by 'Ear Tag' The number of Ear Tags shall be mentioned in the certificate of the quarantine issued by the certifying authority.

(v) The exporters would pay the cost of the Ear Tags and vaccines used for the vaccination of the animals.

6. Quarantine procedure laid down in paragraph 5 above may not be insisted upon where the foreign buyers have specifically contracted for export without quarantine formalities. Exporters shall produce contract (in original) to this effect to the concerned customs authority at the ports.

7. Pre-change commitment in respect of sheep shall be honoured only for the quantities for which the export licences have already been issued by the licensing authorities and is backed by irrevocable letter of credit. In respect of Live Buffaloes pre-change commitment shall be honoured terms of paragraph 226 of the Hand Book of Import and Export Procedure 1983-84. In case of pre-change commitment, quarantine procedure shall not be applicable.

8. Export of Live Goats shall continue to be allowed without any quarantine and vaccination formalities, and would be subjected to

general Veterinary Inspection and certification as hitherto.

Sd/-
(P.C. JAIN)
Chief Controller of Imports & Exports.

(India Exports Newsletter 6(11); 1983; 17-18)

5 Modernisation of rice mills opposed

A delegation of rice mill owners from Tamil Nadu met the Prime Minister Mrs. Indira Gandhi on Wednesday and opposed modernisation of rice mills in the State.

The delegation members said the Prime Minister shared their concern over the prospect of a large number of workers being displaced as a result of modernisation

The delegation consisted of Messrs C.M.Ibrahim, M Soundarapandian, P.Srinivasan, Thangaraj and V.Venugopalan

(Hindu July 6, 1984; 9)

7 Flour mills want wheat supply control relaxed

Flour mill owners have urged the Government to supply them wheat at the same price as that for the public distribution system (PDS) or allow them to supplement their purchases from the open market to enable them utilise their installed capacity to the optimum. Better utilisation of the installed capacity will help open wider avenues for employment opportunities, they say.

Mr. S.P. Virmani, President of the North Zone Flour Mills Chamber said that since the introduction of controls in 1969, till 1980 wheat was being supplied to flour mills and PDS at the same price.

There are 450 flour mills in the country with an installed capacity of nine million tonnes. Of these, 130 mills are in Punjab, Himachal Pradesh, Haryana, Uttar Pradesh, Jammu and Kashmir, Delhi and Chandigarh having an installed capacity of 3.02 million tonnes providing direct and indirect employment to two lakh families.

(Financial Express July 10, 1984; 4)

8 Order on 'vanaspati' amended

The Union government has amended the Vegetable Oil Products (standards of quality) Order of 1975 Restricting the vanaspati units from purchase, stocking and processsing of groundnut oil in the same premises. This Restriction is aimed a curbing speculation in groundnut oil by vanaspati units.

Under the amended order, the vanaspati units are not permitted to stock any vegetable oil other than those permitted, in the manufacture of vegetable oil products. Groundnut oil is not permitted in the manufacture vanaspati.

It has been brought to the government notice that most of the vanaspati units in Gujarat, Maharashtra and in the Southern states indulge in hoarding and speculation of edible oils, particularly groundnut oil to to their income. They carry on these activities under the pretext of stor such oils. The units in the northern states normally speculate in mustard oil.

By amending the vegetable oil products order, the government hopes tha such activities of the vanaspati units will be stopped forthwith.

An official press release said, under the order, a refinery of a vanaspati plant is not to be treated as a separate entity. A separate refi as per law means the one clearly demarcated from the, vanaspati plant, havi a separate tank, pipeline and related records.
(Times of India July 8, 1984, 12)

259 Ceiling on tea export fixed

The Centre imposed a ceiling on export of tea to bring down the price in the domestic market.

Announcing this at a press conference here, the Chairman of the Tea Board Mr. Jagdish Khattar, said the Government had fixed a quota for export for the remaining months of the current year and would watch the market trend before taking further measures like levy on tea production and export duty.

The Tea Board Chairman said the quantum of export is restricted to 215 million kg--the target fixed for 1984. Export licences for 162 million kg, had been issued so far and a large number of applications were pending with the Board.

Because of the highly remunerative prices in the world market, exports were growing at such a rate that the quantity would far exceed the target for the current year. He hoped that with the fixation of quota, domestic tea prices for the remaining period of the current year would fall.
(Hindu Sept 4, 1984; 1)

Change in raw cashewnut import policy

Under the Import Policy for 1984-85, the eligible importers who may be importing raw cashewnuts shall not offer 50 percent of the quantity imported to the Cashew Corporation of India for its distribution to Actual users (Processing Units). This is a major change from the previous year's policy.

The relevant portion of the Imports Policy for 1984-85 regarding import of raw cashewnuts is reproduced below.

"Appendix 6 (page 165)

Item (28) In the case of raw cashewnut, it shall be a condition that, the import contract shall also be registered by the importer with the Cashew Corporation of India within a period of 7 days of its execution.

Item (29) Export Houses and Trading Houses which may be importing raw cashewnuts against their REP/Additional licences under the import policy in force, for distribution to Actual Users (Processing Units), shall register their import contract with the Cashew Corporation of India within a period of 7 days of its execution.

Item (30) Cashew Corporation of India is also eligible to import raw cashewnuts under OGL for distribution to Actual Users (Processing Units) in accordance with the policy in force in this regard."

(Cashew Bulletin 21(5); 1984; 4)

New packaging rules for imports into Greece

According to the Greek Ministry of Commerce, all imported items should carry in their outer packaging a description in Greek of the contents and weight of each parcel. In case the product is imported in a loose form to be packed or bottled locally in Greece, the name of importer of representative in Greece should also be mentioned in Greek.

(Cashew Bulletin 21(3); 1984; 10)

Attestation of photocopies necessary

The Joint Chief Controller of Imports and Exports, Bombay-400 020 has noticed that the applicants for import and export licences have been submitting photostat copies of different documents like Registration Certificates issued by the Sponsoring Authorities, Export House Certificate,

Trading House Certificates, etc. etc. without signing/attesting such pho copies stating that these are true copies of the original documents. Ins nces have come to our notice where photostat copies have been produced before us which were not true copies of the documents issued to the applicants.

In view of the foregoing, it has been decided that, with effect from 1/1/1984 photocopies of documents wherever submitted by applicants to thi office or called for by this office should be signed by the applicants with their rubber stamp showing the name and designation of the officer and categorically certifying therein that the photocopies submitted are true copies of the documents. Failure to heed this may result in rejectio of application. The trade is kindly requested to make a note of the requirement and act accordingly.
(Cardamom 17(7); 1984; 8)

QUALITY CONTROL

263 Food quality board suggested

The Ninth Joint Conference of the Central Council of Health and the Central Family Welfare Council, held recently in New Delhi, has suggested that the Union Government should immediately set up a statutory National Food Quality Board for prevention of food adulteration.

It also recommended the setting up of a Food Quality Board in each State for implementation of a national programme for improvement in the quality of food.

The Conference stressed the need for taking a more stringent action against manufacturers whose products were reported to be substandard.
(Cardamom 17(7); 1984; 9)

264 Panels for meat export

Government has established two committees for supervising arrangements as per international norms for the quality control of meat production prior to export. This follows the recent stringent measures taken by the Government to ensure proper quality of these items for foreign markets. The first committee would expedite the introduction of compulsory quality control for the export of fresh/chilled and frozen meat. It is also expected to propose appropriate amendments to the Meat Food Product Order

(MEPO), so as to cover fresh/chilled and frozen meat in addition to processed meat. It would also look into the different aspects and modus operandi of introducing MEPO to cover the production and export of meat. The Chairman of the Committee would be the Additional Secretary, Ministry of Commerce, Mr. V.C.Pande.

The Second Committee would examine the various steps to be taken to establish quarantine centres at Bombay and Kandla for the export of live stock. The modalities and premises for such centres would be underlined by the Committee.

(India Exports Newsletter 6(11); 1983; 23-24)

HYGIENE

Microwave may be tumour promoter

Glandular changes and a higher rate of cancer were found among laboratory rats chronically exposed to low-intensity microwaves, according to a study conducted by University of Washington researchers.

Results emerging from the study sponsored by the US Air Force have prompted substantial concern among researchers investigating the biological and health effects of non-ionising radiation, according to Microwave News, a specialised scientific newsletter.

In addition to a general increase in cancer incidence, the experimental results suggest that microwave exposure is responsible for wide-ranging effects related to the adrenal glands and the entire endocrine system ' the publication reported.

The adrenal glands, adjacent to the Kidney, and other glands of the endocrine system produce chemical hormones vital to the regulation of many bodily functions.

The Microwave News account noted that the findings could provide an experimental basis for widely reported complaints of headaches, dizziness, memory loss and fatigue from workers chronically exposed to microwave radiation.

The University of Washington research team, headed by Prof. Arthur W. Guy at the University's School of Medicine in Seattle, exposed rats upto 25 months to pulsed microwaves at a level of 480 microwatts per square centimetre.

Results of the study were presented at a scientific conference last month in Atlanta.

The researchers disclosed that there were 16 malignant tumours amon the 100 exposed rats, compared to four tumours among the 100 animals whi were not exposed. The tumours in exposed rats included seven involving the endocrine system--two thyroid, two pituitary and three adrenal gland tumours.

Dr.Samuel Milham, an epidemiologist for the Washington State Health Department said results of the study appeared to point to a "stress reaction" in the exposed animals.

"It looks like the microwave radiation may have been a tumour promote he said in a telephone interview. "It did not initiate the cancers, but once some cancer cells got going it promoted growth of the tumours."

Dr. Milham has conducted statistical reviews that found increased rat of leukemia among power station operators, aluminium workers, power and telephone linemen as well as other workers chronically exposed to electric and magnetic fields.

(Hindu August 18, 1984; 5)

266 Chlorinated insecticide residues in human fat samples

The body burden of organochlorine insecticides in the general populati was assessed by monitoring the residues in 313 human fat samples from perso of either sex, between the ages of 10-60 years, collected at autopsies in several urban centres (Ahmedabad, Bombay, Calcutta, Bangalore, Bhopal, Chandigarh and Agra) representing different zones of the country.

The averages for total DDT, BHC and their major isomers i.e. pp'DDE and beta BHC showed that though the mean DDT and BHC levels were 11.04 and 3.49 ppm, the most recurrent values (mode) for DDT and BHC were 4.04 and 1.09 ppm. Further, 50 per cent of the total samples showed DDT residues below 5.98 ppm; whereas it was 1.84 ppm for BHC. The frequency distribution curves for DDT and BHC residues were found to be highly skewed. The levels of major isomers of pp'DDE and beta BHC indicated that they contributed about 60-70 per cent of total DDT and BHC in the fat tissue.

The sex-wise distribution of these residues suggests that the males were more prone to accumulate these chemicals as compared to the females. This probably due to less body fat in males than in females.

The mean values of DDT and BHC residues from human fat in urban centres of various zones of the country showed a wide variation. The

maximum and minimum for DDT residues being 21.81 ppm in Ahmedabad, and 6.15 ppm in Bombay samples respectively, and for BHC the maximum and minimum residues were 5.05 ppm in samples from Bangalore and 1.06 ppm from Bhopal samples.

(ICMR Bulletin 14(6); 1984; 72-73)

7 Organochlorine insecticide residues in human milk

The residues for DDT and BHC were monitored in 50 human milk samples collected from Ahmedabad, as a part of an Inter-country WHO/UNEP project on "Assessment of environmental exposure through biological monitoring" involving participation of several countries like India, China, Mexico, USA, Belgium, Japan, Federal Republic of Germany, France, Sweden, Yugoslavia, etc. The results of this monitoring showed that the median level of pp DDT in the fat of human milk in India was 1.1 mg/kg. which is close to that observed in human milk samples from China and Mexico (1.8 and 0.71 mg/kg respectively). The residue levels were several fold higher than those observed in other participating countries. The median levels of pp DDE the major metabolite of pp DDT in breast fat in Mexico, China and India (3.7, 4.4 and 4.8 mg/kg respectively) were also markedly higher than those reported from other countries. Similarly, the median levels of beta HCH in human milk fat from China, India and Japan (6.6, 4.6 and 1.9 mg/kg respectively) were relatively much higher than those reported from other participating countries.

The calculated daily intake of pp DDT and pp DDE by breast-fed infants indicated that the intake of the DDT complex by some or most breast-fed infants in all the participating countries exceeded the acceptable daily intake (ADI)

(ICMR Bulletin 14(6); 1984; 73)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

68 National alcohol fuels information centre

The National Fuels Information Centre (NAFIC) has been established as an extension of the Solar Energy Information Data Bank to serve as a

clearinghouse of information on the production and use of alcohol fuels. The objective during the first six months is to respond to enquiries from public, responses which will vary according to the nature of the enquiry and the background of the requestor.

The branches of SERIs (Solar Energy Research Institute) Information System Division are providing support to meet the demand for information alcohol fuels:

-- The Solar Energy Information Centre is developing a core collection of documents.
-- The Data Base Development Branch is taking priority action to develop an alcohol fuels component for the manufacturer's data base which will provide information on equipment suppliers.
-- The Information Outreach and Dissemination Branch has begun production of several new alcohol fuel publications.

This combined effort, with support from regional solar energy centres, state solar offices and other SEIDB Network participants, will lead to fast generation and dissemination of information on alcohol fuels.
(Appropriate Technology 7(3); 1980; 2)

269 Loan to small units

The Reserve Bank of India has instructed all commercial banks to not only treat loans extended to small scale industry as priority sector advances but also grant a certain degree of preference to the credit demands of such units besides offering concession in the matter of interest margin and repayment periods.
(Cardamom 17(6); 1984; 11)

270 Schemes registered with D.G.T.D. during May

List of Schemes Registered with D.G.T.D. during the months of May, 1984 (State-wise) Order: Name and address of the party Location viz tehsil & distt; item of manufacture, capacity.

L.Pandu Ranga Reddy 9. Football Stadium Fateh Maidan Hyderabad 500005 Shamirpet Village Jangaon Warangal Vegetable oil by solvent extraction process in terms of rice bran 30000 M.T

Hari Gopal Lunani 22B-13-11, powerpet Eluru 534002 Kalaparru Village Nusvid Krishna. Mango pulp/mango juice 400 M/T, Pineapple slices/pineapple juice 4000 M/T, Jams/vegetable & fruit products (excluding pickles & chutneys) 3000 M/T.

M.N. Prasad Plot No. 142, Srinagar Colony Hyderabad 500873 Bollaram Narasapur, Medak, Lactic acid 200 M/T.

Y. Appa Rao Room No. 10, First Floor, Abid Shopping Centre, Chirag Ali Lane, Hyderabad 500001 Niddavolu, W. Godavari Vegetable oil by solvent extraction process in terms of rice bran 9000 M/T.

Krishna Fruit Products Ltd. Nuzid 521201, Krishna Distt. Nuzid Krishna, Fruit juices 3000 M/T, Fruit Jams 1065 M/T, Fruit slices/titbits (excluding items reserved for s.s. sector) 360 M/T.

HMM Ltd. 1 Jai Singh Road, New Delhi, Rajamandry E. Godawari, Proposed fruits & vegetable products (excluding pickles & chutneys) 3000 M/T.

(a) Enriched cereal foods 1500 M/T, (b) Cocoa products including chocolates 1000 M/T (c) Ready to eat convenience foods 500 M/T. Powered soft drinks 1250 M/T.

Pradeep Shah, C/O Tea Distributors (1) Pvt. Ltd. 27/2 Siyaganj White Chambers, Indore 452 007 Indl. Area Pitampur Village Pitampur Dhar Vegetable oil by solvent extraction process in terms of rice bran/soyabean/minor oil/oil cakes 20000 M.T. Refined vegetable oil, 15000 M.T.

Madhya Pradesh Soya Products Co (P) Ltd. Post Box No.2 P.O. Bina Distt, Sagar, Bina Khurat Sagar. Vegetable oils by solvent extraction process in terms of soyabean, 30000 M.T. Refined soyabean oil (including soya deoiled cakes, soya husks, soya concentrated, protein isolated and lecithin) 9150 M.T.

Laxam Singh Bhadoria M-20 Ramakrishnan Puri Gwalior II Near Guna Guna Starch Bye products 10000 M.T. Corn oil 500 M.T. Corn steep 500 M.T.

R Devdass Thambi Nilayam Udayapatti P.O Salem 636 014 Manganallur Mayaladuthurai Tanjore Vegetable oil by solvent extraction process in terms of soyabean 30000 M/T. Refined vegetable oil 5000 M/T.

R.Nathan 915 Poonamallee High Road Madras 600 084 Vepur Virudhachalam South Arcot Vegetable oil by solvent extraction process in terms of soyabean 30000 M/T., Refined vegetable oil 5500 M/T.

P. Ethiraj 4 C, Ormes Road III Cross Street Kilpauk Madras-600 010 Kallipettai Harur Dharmapuri Vegetable oil by solvent extraction process in terms soyabean 30000 M/T. Refined vegetable oil 5200 M/T.

Vorion Chemicals & Distilleries Ltd. 10, Sriman Srinivasa Road Alwarpet Madras 600 018 Vedanarayanapuram Venpakkam Chingleput Industria alcohol 5000 K.L.

Golden Refineries (P) Ltd. Karttupalayam Vellakovil (P) Periyar Dis Karattupalayam Vellaakovil Periyar Refined vegetable oil 7500 M/T

Sree Balaji Refineries Pvt. Ltd. Rayarpalayam Post Tiruchengode Taluk Salem Distt. Rayarpalayam Tiruchengode Salem Refined vegetable oil 3000 M/T.

Maruti Industrial Carbohydrates Pvt. Ltd. No. 61 Burkit Road T. Nagar, Madras 600 017 Pondicherry Sodium carboxy methyl cellulose (Pure) 300 M/T, Sodium Carboxy Mehtyl cellulose (Technical) 300 M/T. Hydroxyethyl cellulose 352 M/T.

Ved Prakash Gupta Zanana Hospital Road Faizabad Kurebhar Sultanpur Vegetable oil by solvent extraction process in terms of rice bran/mauha/ other oil cakes 16000 M/T.

Dr. Ahmed Jilani SBI Officers Colony 19, Vikermaditya Puri Bareilly Kishanpur Kichha Nainital Refined vegetable oil 15000 M.T.

Wimpy Foods (1) Pvt. Ltd. 3312, Loni Road Mohan Nagar Ghazibad Mohannagar Ghaziabad/(a)Chicken durgers 800 M.T. (b) Lamb burgers 700 M.T. (c) Fish Fried 250 M.T. Potato chips 1500 M.T. Vegetable process foods (Except pickles & chutneys) 2200 M.T.

R.K. Gupta 144, Aggar Nagar Sector-I, Ferozepur Road Ludhiana Rudrapur Nainital Refined vegetable oil 15000 M.T.

Saraf Oil Udyog Ltd. 53, Chowringhee Road Calcutta 700 071 Gurbhuktana npur 24-Parganas Hydroxy citronellal 8 M.T. Citronella 35 M.T. Geraniol 45 M.T., Residues 28 M.T.

(Economic Times July 3, 1984; 7)

271 Rabbit farm

The rabbit farm at Sirsi, was inaugurated by Mr. Sanjay Das Gupta Special Deputy Commissioner recently. The farm the first of its kind in the State has been launched by the North Kanara District Rural Development Society, on an experimental basis.

The DRDS has planned to develop the farm on a large scale. A sum of Rs. 5 lakhs have been earmarked for its development, said Mr. Gupta. It was proposed to build a cold storage in future to store rabbit meat, he said.

Canning of the meat would also be taken up later on for export he added.

(Hindu August 3, 1984; 20)

DE INFORMATION

de enquiries

Asian Market,
Konrad-Adenauer-Str. 15,
D-5650 Solingen 1
F.R.G.
Tel: (02122) 17193
All spices

Mr. Jagdeep Sahani,
Managing Director,
AL OTHMAM & AL BISHER
TRADING CO. W.L.L.
Post Box 22984
Safat, Kuwait (AGULF)
Tel. 832260-841093
Telex: KT 23550
Cardamom green

Allied Enterprises,
P.O. Box 1579,
Deira-Dubai,
U.A.E.
Tel: 225456
Telex: 45475 ALLENT EM
Cardamom green

M. Depuydt,
N.V. Natumix,
Maalstraat 39,
8640 Moorsele,
Belyie.
Tel: (056) 50, 27, 24
Telex: 86, 198-Natumx.
Cardamom spice and oil
Oleoresin

Dan-Shaba Trading
Amager Boulevard 2, St.
DK 2300 Copenhagen S-Denmark
Tel: 01 541952
Telex: 16600 FOTEX DK.

6. Mr.P Van Cotthem,
Verstegen Specerijen
Giessenweg 62,
3044 AM Rotterdam
Tel: (010) 155100
Telex: 23008 Picol NL.

7. Paula Pohjakallio
KY INPAC KB,
Liluodonkuga 4,
SF-00980 HELSINKI 98,
Finland,
Tel: 3580 317377
Telex: 121248 Paula sf.
Cardamom

8. Mr. A. Hogenaar,
Brood-Banket Bakkerij,
Konditorel-ljssalon,
Ring 32 Haamstede,
Holland, Tel 0115 1464-1215
Cardamom oil

9. Mr. Angel Jobal, S.A.
Princesa, 38,
Barcelona 3,
SPAIN, Eele 319 7802319 78 05
Cardamom Bleached

10. Daarnhouwer & Co,
Dep, Chainstores,
Asia-Haus,
49, Ost-West-Strasse,
2000 Hamburg 11
Tel 331071
Telex: 02 162406.

11. Mr. K.V. Andersen,
E.Bieriag International Spice Trading APS.
jndustrievely 32 36,
DK 4683 Ronnede.
Tel 03711626
Telex: 43518
Cardamom and Cardamom Powder-Big Cardamom also

12. Hans-Dieter Rabenstein,
E.H. Worlee & Co. M.B.H.
Bellevue 7-8
Postfach 60 29 60
D-2000 Hamburg 60
Tel 040/27 134-168
Telex: 211673 Worle d.
Cardamom Powder

13. Nordflaks AB,
Department Stores,
Box 63 43121, Molndal
Tel 031 275020
Telex: 21613 NFSPICE S

14. Izadco Inc.,
1425 Broadway, Suite 16,
Burlingame, CA 94010

15. Black Boy,
H.CHR. Olsens Eftf A/S,
Grundsetmoen 2400 Elverum,
Tel (064) 12833.

16. AB Boden & Lindeberg.
Sjoviksbacken 10,
S-11743 STOCKHOLM
Tel: + 46 8.45 3853
Tel: 17704 HANSBOS.
Cardamom

17. Teas & Spices,
The Herb Farm (Canterbury) Ltd.
Broad Oak Road, Canterbury,
Kent, England.
Tel: (0227) 52254/56811
Telex: 96118 ANJEC G
Cardamom 500 kgs.

18. Kiro Biscuiterie,
Le Squet,
2.Rue des Suisses,
F-06400 Cannes,
France
Tel (93) 39, 54, 49
Cardamom powder & oil

19. Latona S.A.
Cite DEL ouest 2,
CH 2006 Neuchatel
Switzerland
Tel (038) 244958
Telex 35100 TXCAB CH.

20. Allatini, S.A.
32 Kifissias Str.
Paradissos,
Amaroussion,
Greece.
Tel. 68 20 750
Telex: 215538
Cardamom biscuits

21. Aziz Ahmed,
Maronik (Export Import) Ltd.
573 Upper Richmond Road West,
Richmond, Surrey
Great Britain
Tel 01.876

22. Peacock Products Ltd.,
Peacock House,
52 Rochester Raw,
London SWIP IJT
Tel 01 828 8388
Telex 8956068 PEACOK G.
Cardamom 100 M.T.

23. Aspa Orient Gmbh & Co,
Kaiser Str. 50
6, Frankfurt.
Cardamom/Whole powder

24. K.Afhar,
Kefan Ltd. Food Suppliers,
Unit, 3 Central Trading Estate
Marine parade.
Northam,
Southampten 50 IPJ
Telex: 47793 KEFAN G

25. M.Aloudin,
Alkno, Cash and Carry,
Tropical Foods and Spices,
Rungdorfer Strasse 39,
5300 Bonn-2,
West Germany
Tel. 0228-363112
Telex: 8869460
Cardamom in consumer
packs of 1 to 5 kgs.
(Cardamon 15(12); 1983; 18-19)

Buying agent in Kenya

Mr. Harum Osama proposes to act as a buying agent for European importers on a 1% Commission basis, in Kenya. Further details: Mr. H. Osama, P.O. Box 16461, Nairobi, Kenya
(Cardamom 17(7); 1984; 8)

Tin price raised

The official pricing committee of the Minerals and Metals Trading Corporation (MMTC) has raised the price of tin by Rs. 9000 per tonne to Rs. 275,000 per tonne

The new price of tin, effective July 1, 1984, is ex-godown for sale from the MMTCs godown, excluding sales tax, octroi duty which are extra at actuals.

The committee raised the prices of tin, nickel and antimony metal owing to a rise in the international prices as also because an increase in the value of the US dollar and the Malaysian dollar.
(Economic Times July 8, 1984; 1)

Discount in advertisement charges by AIR

All India Radio allows 15% discount in advertisement charges if small scale units book the advertisement direct with All India Radio Stations. For this the small scale industrial units will be required to produce certificate in respect of their status from appropriate Central/State Governments Department.

For availing this discount small scale units can approach Station Directors of 29 Commercial Broadcasting Stations including 14 link stations and obtain the rate card for booking of radio-spots sponsored programmes etc. on various stations.
(Sisi News letter June 1984;)

276 New Plants for Processing of Fruit Products

Government has decided to set up two new processing plants for productio of mango and pineapple products. The plant for the production of mango pulp will be set up at Bhagalpur (Bihar) and the plant for production of pineapple juice will be set up at Silchar (Assam). These new projects will be implemented by the Modern Food Industries, a public sector undertaking under the Union Food Department. The projects are expected to be completed during the current financial year.
(Economic and Commercial News 14(21); 1984; 2)

PERSONALIA

277 Prof. Yash Pal Secretary Dept. of Science & Technology

Prof Yash Pal, chief consultant Planning Commission, has been appointed Secretary Department of Science and Technology in the place of Dr. S. Varadarajan, who has taken over as Director General of Council of Scientific and Industrial Research.

Before joining the Planning Commission Prof. Yash Pal was Director of Space Application Centre, Ahmedabad.
(Hindu, September 5, 1984; 9)

RAW MATERIALS

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278 Improved tomato variety developed

An improved and larger-than-usual tomato variety has been developed by the Queensland Department of Primary Industries' Bowen horticultural station.

Developed from a cross between the United States varieties, Flora-Dade and Calypso, the new variety is significantly larger than other types and matures in a more concentrated pattern. It is particularly suited to winter production in northern Australia when existing varieties often yield small fruit.

Named Delta Contender, the plant carries resistance to *Verticillium wilt* Race 1 and *Fusarium wailt* Races 1 and 2.

Seed will be available for sale by October or November this year. *(PTI Science Service 3(15), 1984, 14-15)*

STORAGE AND INFESTATION CONTROL

279 Radiation disinfestation of grains

The most common way to protect grain from pests is to treat it with poisonous chemicals. Though quite reliable, this method has serious shortcomings. First, grain needs degassing after such treatment. Second residues of poisonous chemicals contaminate the grain -- and the environment. Third, pests get 'accustomed' to some insecticides.

The gamma-ray treatment of grain is more effective. The Co^{60} (a radioisotope of cobalt) or Cs^{137} (an isotope of cesium) gamma irradiation even in minimum doses 20 krad--sterilizes most of the pests in stored grain. However, this method also is not without its shortcomings, as it calls for an uncont cllable radiation source and reliable personnel safeguards.

The use of electron accelerators as radiation sources means a dramatic increase in disinfestation efficiency.

The VNIIZ and the Nuclear Physics Institute of the Siberian branch of the USSR Academy of Sciences have created a radiation disinfestation unit (RDZ) which makes grain 100% free of pests. In the RDZ, accelerated

electrons are generated by an ELV-2 accelerator rated at 20 kW. The electron beam energy is 1.4 MeV.

In the elevator at the Port of Odessa Soviet scientists irradiated, using an RDZ, a batch of grain infested with rice weevils and meal beetles (Infestation density: 50-100 specimens per 1 kg in the open form, and over 700 in the latent form). On each of the two lines, disinfestation effect was 100% at an irradiation rate of 150 tonnes of grain per hour (as against 80% in the case of methyl bromide fumigation).

The Ministry of Health of the USSR has sanctioned the irradiation, on a commercial scale, of bread wheat grain with a beam of accelerated electrons of up to 4 MeV, in doses of up to 100 krad.

Besides the Soviet scientists, who have proved the harmlessness of irradiation to grain, the WHO, FAO and IAEA committees of experts have recognised as absolutely harmless disinfestation of bread grain by irradiation with a doze of gamma-rays of up to 100 krad, or with a beam of accelerated electrons at an energy level no higher than 10 MeV. As already indicated, the ELV-2 accelerator employed by the Soviet RDZ emits electrons or at a 1-4 MeV energy level. Depending on the speed at which it passes under an electron beam, grain receives an irradiation dose of 20-40 krad, which is about a third or even a fifth of the permissible figure.

(PTI Science Service 3(18), 1984, 4-5)

280 Disperser

Food plants, hospitals, and recreation areas can use the "Dura Fog ULV MAG" for protection against insects, germs and odours. The light, compact unit is easily transported on golf carts or other small vehicles and features an "ultra low volume" spraying technique said to use less insecticide than conventional methods. It incorporates both a sonic jet air blast nozzle and a positive displacement air pump to give the best aerosol dispersion and particle size, the firm states. Options for this product include remote nozzle and wheel mounting. The device automatically disperses insecticides, germicides, etc.

(Financial Express 18 Nov 1984, 6)

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FOOD ADDITIVES

281 Cheese flavour enhancer

Cheddar Cheese Powder Enhancer, called Deb-E-K, can extend the cheddar flavouring notes in snacks, sauces, spreads, salad dressings, or wherever cheddar cheese powders are used. The natural cheese powder enhancer can reduce up to 40% of the cheese powder formulated in a variety of food applications. According to the manufacturer, the enhancer extends flavour effectiveness while providing a significant cost savings to the processor without loss in product quality. For more information and a free sample contact: Marketing Department, Crompton and Knowles Corp., Flavors and Fragrance Division, 17-01 Nevins Road, Fair Lawn NJ 07410 (phone 800-631 8305)

(Food Technology 38(7), 1984, 88)

282 Natural Chicken Flavour

This is based upon enzyme modified chicken meat may be used in dry mixes, frozen products, sauces, and gravies. The flavour is heat stable and therefore may be used in retorted products. It has a low sodium content and may be used for sodium controlled formulations. The suggested use rate of Natural Chicken flavor FC-100 is from 0.5-2.0%, depending on application. For samples or other information, contact SSC International, Inc., 3 Waters Park Drive, Suite 230, San Mateo, CA 94403 C Phone 415-570-5333)

(Food Technology 38(7), 1984, 88)

283 Chitosan in food industry

Chitosan is a modified, natural carbohydrate polymer derived from chitin, the structural material in crustacea shells. It is widely used in Europe and Japan as a beverage clarifier, and Marine Chemicals and Research Company has applied to the FDA for approval to use it in U.S. wine and fruit juice industries. In tests with Washington State apples, chitosan reduced the percentage of pectin; improved the clarity of juice; and produced a solid flocculent cake. It can also be used to promote gels, and to coagulate protein materials from the wastes of breweries and fish and vegetable processing plants to produce sludges that can be dried for animal feeds. For more information write to Marine Chemicals and Research Co., 3974 150th Ave. NE, Redmond, WA 98052 (phone 206-823-2185)

(Food Technology 38(7), 1984, 88)

284 Various Oils, Surfactants, and Their Blends as Replacements for Shortening in Breadmaking.

Various concentrations of 14 different oils, alone and in blends with each of two surfactants, were studied to determine which oils were superior in breadmaking. We determined the amount of each oil. Stearoyl-2-lactylate (SSL), or diacetyl tartaric acid esters of monoglycerides and diglycerides (DATE) needed to reach the midway volume of bread between those for no shortening (899 cc) and 2-3% shortening (1.009 cc), and then blended those midway amounts of oil and either DATE or SSL to determine whether synergistic effects occurred. Six grams of each oil alone was required to give the loaf volume equal to that for 2-3% shortening in the formula. The midway volume for most of the oils was 2% and for SSL and DATE was 0.2%. When 2% of each oil plus 0.2% SSL or DATE was added in the formula, all bread volumes were equal to or somewhat greater than that for the control containing shortening. When 2% of each oil and only 0.1% of SSL or DATE were added, most loaf volumes were equal to or somewhat greater than that of the shortening control. Thus the mixture of oil and surfactant produce synergistic effects. The availability, lower of cost, and ease of handling the oils, together with the low concentration of a single surfactant (0.1% SSL or DATE), are incentives for the baking industry to use a combination of oil and surfactant.
(Cereal Foods World, July 1984, 425)

285 New preservative keeps fish fresh

Fish can now be caught and stored at 22 C, it will still be fresh when landed the next day by virtue of a new preservative used in place of costly refrigeration. Developed in Federal Germany, the new agent can be used by fishermen in the developing countries where costly and complicated facilities are not available

It consists of salt, citric and sorbic acid. Between one and two percent must be added to each tonne of catch, or say 15 kg per tonne of fish.

The technique has been tested by veterinary research scientists. It is not a health hazard and has been found to comply with foodstuff regulations and quality requirements
(The HINDU, Sept 26, 1984, 26)

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86 Preservative in milk found dangerous

A team of scientists from Varanasi has warned against a proposal to add thiocyanates as preservative in milk.

As this was likely to increase the prevalence of goitre in endemic areas.

The scientists estimated thiocyanate content in milk samples from packs and bottles available in Delhi and Varanasi. Fresh buffalo and cow milk samples were also collected from these places.

Estimates of the samples showed all types of milk in Delhi and Varanasi have naturally occurring thiocyanate, varying from 10 to 20 mg per litre and this is not changed by boiling.

The proposed level of sodium thiocyanate (at 70 parts per million) for preserving milk is about five times this natural content and this will surely raise the milk thiocyanate content to 80 to 100 mg per litre, the researchers say.

The investigators say that in the event of permitting addition of thiocyanate as preservative, milk and its products will substantially hike the thiocyanate levels in the diet. It is likely to increase the the prevalance of goitre in endemic areas.

Since milk is recommended for pregnant women and children, pre-school and school children receiving thiocyanate in milk (if it is added as preservative) could suffer impairment in physical and mental development. The scientists have emphasised the need to take steps to prevent worsening of the problem, and to pre-empt addition of thiocyanate as milk preservative.

The emergence of goitre in Delhi is apparently a recent phenomenon and have factors similar to those that have operated in Delhi must have been at work in other locations as well, they believe.

(PTI Science Service, 3(20), 1984, 7)

PROCESSES

287 Production of heat-stable microbial amylase

Microbial enzymes are being commercially exploited to a great extent during the last few decades, α-Amylase is one such widely used industrial enzyme. Although most of the commercially used bacterial α-amylases can withstand a moderately high temperature (75 C) there has been interest in

finding out amylases which can withstand higher temperatures. Amylases active at a temperature of 90-100 C have better application potentials in starch and starch-based industries.

Thermophilic microorganisms produce more thermostable enzymes than their mesophilic counterparts. Keeping this fact in view, a researcher, Shri Binod Kr Gooit at Regional Research Laboratory, Jorhat, has attempted isolation of thermophilic bacteria which produce highly heatstable extracellular $\mathcal{L}$-amylase. After extensive screening, a strain of *Bacillus stearothermophilus* which could produce thermostable extracellular $\mathcal{L}$-amylase was selected for further studies. The $\mathcal{L}$-amylase produced showed a temperature optimum of 80 C. The enzyme was active over a wide range of pH 6-10.6. Conditions for the production and isolation of the enzyme were worked. An attempt was made to enhance the heat stability of the $\mathcal{L}$-amylase obtained by crosslinking the enzyme with glutaraldehyde, benzidine, 1.5-difluoro-2,4-dinitrobenezene, and 2,4-dichloro- 6-carboxymethylamino-5-triazine. The $\mathcal{L}$-amylase modified with glutaraldehyde showed better heat stability.

(Chemical Age of India 35(3), 1984, 195)

288 Enzymes boost fruit yield

Three liquefaction techniques that use enzymes to produce high-quality fruit drinks, pulps and concentrates are offered by Roehm GmbH. Among this new technology's benefits: Yield of available fruit up to 90%, far above conventional methods; also, time, labour, heat and energy costs are trimmed significantly. A key benefit, further: the drinks or concentrates produced via enzyme liquefaction involve processing the entire fruit. And, with enzymes' effectiveness at lower operating temperatures, there's minimal loss of nutrients, flavor or aroma. Each of the new enzymes -- Rohament P , Rohame PC and Rohament B 1 -- affects fruit differently, each yielding a different end product.

(Food Engineering International, July-August 1984, 16)

289 Parboiling minor millets for better quality

The physical characteristics of millets were not changed by parboiling. The soaking time required at room temparature was 24 hours and drying was done upto a moisture level of 14%.

Due to parboiling, the shelling efficiency was increased by 4 and 3% for samai and varagu respectively. The parboiled millets showed significantly better yields of head grains and reduced breakage compared to the raw grains at all degrees of polish. The whiteness and translucency scores increased with progressive polishing for both millets.

The protein content was significantly higher in the parboiled grains. The thiamine and riboflavin were better retained in the parboiled grains than the raw grains.

(Tamil Nadu Agricultural University News letter 14(4); 1984; 2)

29 Bleaching in-shell walnuts

The Regional Research Laboratory (RRL), Jammu, has developed an improved technology for bleaching walnuts. The process involves treatment of nuts with the solution in a mechanically tilted enclosure which effects surface abrasion due to fast agitation.

During a short reaction time of 3-5 minutes, the adhering resinous material is loosened and separated from the shell and simultaneous surface bleaching takes place as a result of chemical action. The nuts are rinsed in plain water for a minute and sun-dried.

While the improved technology has already been adopted, efforts are being made by the laboratory to further improve the device and also to introduce complete mechanisation so that the entire bleaching operation takes place in a single composite unit.

The traditional practice of bleaching involves ranking of walnuts (in lots 40-50 kg) in solutions of soda ash/quick lime/ bleaching powder/mild caustic, singly or sometimes in combination. After this initial treatment, the walnuts are transferred to a tank containing dilute sulphuric acid. From this tank they are transferred to clean water for rinsing and washing, finally sun-dried for 2 days. The process is ineffective, crude and cumbersome. During treatment some water enters the shell through crevices, making the kernels prone to fungus attack.

(PTI Science Service 3(17), 1984, 11-12)

291 Sterilization of milk using pressure cooker

In summer, we often find that even boiled milk gets sour if it is not boi 2-3 times a day. This souring could be prevented by keeping the boiled milk in a refrigerator. For those who have no refrigerator, here is an easy method of preserving milk for a longer period than by repeated boiling.

In this method, a pressure cooker is used to sterilize the milk as the temperature attained inside the cooker (about 122 C) under full cooking pressure is sufficient for this purpose.

About one litre of milk is taken in a clean vessel of capacity slightly more than one litre capacity and covered with a plate. The vessel is placed on the grid inside a 6.5 litre cooker and sufficient water is poured under the grid. The cooker is then closed with its lid and the weight placed in position. The milk is heated under maximum cooking pressure for about 10 minutes (i.e. after the first whistle). After sterilization the cooker is kept aside for 36 hours. When the cooker is opened at the end of this period the milk is remains in good condition.

(Invention Intelligence 19(4), 1984, 149)

292 Tea and coffee in capsule

After the 'instant coffee' it is now coffee complete and tea complete for an off-the-table quick refreshment. Unlike the instant coffee, the two products, evolved by the National Dairy Research Institute, Karnal do not require the addition of sugar and milk, but just water.

The two products have been evolved by incorporating instant soluble coffee or tea into a sweetened full cream milk base.

One hundred grams of coffee complete contains 7.2 g of instant coffee, 8.1 of milk fat, 20 g of non-fat milk solids, 38 g of sugar and 26.7 g of water. One hundred grams of 'tea complete' contains 13 g milk fat, 31.5 g milk solids-no-fat, 39.5 g sugar, 14 g tea solids and 2 g moisture.

Production coffee complete involves a two stage process. The first stage is preparation of sweetened condensed full cream milk corresponding to the composition of 9 per cent fat and 22 per cent solid-not-fat. The technique of production consists of the conventional treatments, namely, forewarming or pre-heating, condensing under vacuum with addition of sugar, inducing micro crystallisation of lactose, and cooking.

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The second stage consists of the incorporation of concentrated instant coffee into the sweetened condensed full cream milk. The coffee is added in the form of a concentrated solution made in boiling water, precooled before admixing with the tempered sweetened condensed milk base. The addition is to be carried out under aseptic conditions and is to be followed by proper mixing and cooling to avoid incomplete admixture, and improper crystallisation. The product is to be finally packed either in tin plate cans for institutional use or in aluminium tubes for retail use.
(PTI Science Service 3(19), 1984, 13)

293 Process to produce iodised salt

The Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnager, has developed a simple and labour-intensive process (submersion method) for manufacturing iodised salt.

The process involves submersion of solar salt in saturated brine containing a sufficient quantity of calcium iodate, followed by draining or centrifuging. The necessary level of iodine in brine is maintained to get 15 ppm of iodine in iodised salt (IS: 7224). By this process, iodine is distributed uniformly and is more stable.

The process can be adopted on a cottage or small scale of 1-10 tonnes per day. A mechanical plant of a capacity of 100-200 tonnes per day could also be set up. Continuous iodisation by the submersion process with a capacity of 100 tonnes per shift requires an investment of about 6.0 lakhs
(PTI Science Service, 3(15), 1984, 6)

BYPRODUCTS AND WASTE UTILIZATION

294 Vinegar from coconut water

Researchers at the Coconut Research Institute of Sri Lanka have found that a mixture of toddy and coconut water could be used to produce commercial grade vinegar.

The process, which uses 40% coconut water and 60% toddy, remains the same as for traditional vat process. But the nut water should be mixed with toddy only on the second day of alcoholic fermentation.

Coconut water is an abundant by-product of copra making. This highly perishable by-product could be used for making vinegar. The process is imple which makes it ideal for household manufacture and for cottage industry when followed in a bigger scale.

Describing the process, the researchers said 250 grams of brown sugar' is added to three litres of strained coconut water and mixed thoroughly. The mixture is boiled for five minutes and then cooled to about 40 C. Bakers yeast is dissolved in one cup of this warm solution, and is added to the whole volume of the solution and mixed well.

The container is covered with cloth or paper and allowed to ferment for a week. 1.5 litres of coconut vinegar residue is added to fermented solution and mixed thoroughly. The container is again covered with cloth and allowed to ferment for another week.

After one week's fermentation, the acidity of vinegar will be approximately 2-3%. About three litres of vinegar could be harvested and the rest could be reserved for use as 'mother vinegar' for succeeding mixes.

(PTI Science Service 3(19), 1984, 24)

295 Natural plant and fruit extracts

These are produced by Northern Aromatics Limited of Manchester, England, are now distributed in the United States by Strahl & Pitsch. These herbs, which are reported to have uniform and consistent quality levels, are available from stock. They include angelica, arnica, birch, chamomile, elder, ginseng, hops, linden, marigold, meadow sweet, rosemary, sage, sunflower, thyme, witch hazel, and yarrow. For further details or for specifications and technical data about these and other freeze-dried flavours, contact Strahl & Pitsch, Inc, P.O. Box 1098, West Babylong NY 11704 (phone 516-587-9000)

(Food Technology 38(7), 1984, 92)

PROCESSED PRODUCTS

296 Humanised buffalo milk

A new baby food, which bears close similarly to breast milk, is claimed to have been developed by scientists at the National Dairy Research

Institute, Karnal (Haryana).

The baby food conforms to the recent standards of the World Health Organisation and the Food and Agricultural Organisation Code. Trials conducted over 100 infants show that it is very much similar to human milk.

This 'Humanised Buffalo Milk' (HBM), is the only of its kind in the world that permits intestinal implantation of *Bifidus flora* which provides protection against disease.

Presence of *Bificobacterium bifidum* in the formulae has demonstrated that it provides protection against diarrhoea and other infant diseases under clinical conditions.

The cost of production of this milk is estimated at Rs 18.50 per kg, including packaging, which is less than half the cost of available milk powder for babies (Rs. 42 to Rs 50 per kg).

Human milk consists of one per cent protein, 3.5 per cent fat, seven per cent carbohydrate lactose and 0.2 per cent minerals while the humanised buffalo milk (HBM), developed by the institute, consists of 1.1 per cent protein , 3 per cent fat, 7 percent lactose and maltodextrins (carbohydrate) and 0.2 per cent minerals and bifidus growth stimulating factors.

The technological feasibility for the manufacture of infant food from humanised buffalo milk has been established. The major alterations in the final spray-dried product (traditional method to manufacture the food) has been in relation to lowering of calcium, degradation of α_s-casein' by 'trypsin', partial replacement of milk fat by a blend of vegetable oil, and fortification by lactose and a vitamin mixture.

(PTI Science Service 3(19), 1984, 11)

297 Ginger tea

Tea made from pure roasted ginger offers a fragrant and refreshing beverage with useful medicinal properties.

Produced by Vitafarm Health Products Pty Ltd it is packed in bags for one cup serves. It is free from preservatives, artificial colour and added flavouring and has a shelf life of two years.

It induces relaxation, is a carminative to reduce flatulence and is helpful in clearing chest and nasal congestion during colds and influenza.

The brew has been used for centuries by the Chinese, especially after a heavy meal

The tea can be taken hot cold or iced, and with sugar or ho

The bags are packed 25 to a box which is attractively labelled and carries an explanation of the benefits and brewing instructions.

(Australian Trading News, August 1984

EQUIPMENT AND MACHINERY

298 Areca peeler

Jnana Prabodhini's Kotibhaskar Smriti Udyog manufacture an areca betel-nut peeler of 40 kg/hour processing capacity. Operation comprises a belt conveyor continuously feeding raw arecas to the rotary drum, where the nuts get trapped in special rubberised helical shoes and get peeled off. The peeled nuts, along with the pericarp (husk), are delivered through an outlet into a rotary grader. An air blower blows off the husk The output received is finally segregated. All sizes of dried areca can be peeled by the machine, and even the koka variety reportedly gets peeled and converted to the patora variety. The unit weighs about 265 kg and works on 2 HP, 3 phase motor.

(PFNDAI Newsletter No: 24, 1984, 3)

299 Domestic flour mill

Ratan Engineers have developed a domestic flour mill for grinding food products such as corn, pulses and spices as well as chemicals. The mill is equipped with a hopper and an operating knob, and is capable of grinding from 10 to 15 kg of materials, per hour. The stone size is 20.32 cm. The unit is attractively painted to suit the decor. Also available are machines for converting paper, grinding minerals, selecting metallic yarn, and drilling tube-wells. For further information write to, Ratan

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Engineers, Novelty House, Ghas Katla, Ajmer, Rajasthan 305 001
(Industrial Products Finder 12(12), 1984, 18.

0 Pulverizer

Unique pulverizer is of an original design, and pulverizes any dry material without generating heat and without damaging the quality of the raw material. It pulverizes tobacco, foodstuff and spices. It is available in different models, to pulverize material from 7 kg to 1 tonne per hour. As there is no direct pounding, no spares wear out, there is no dust and the working is silent. The mesh of the pulverised material can be adjusted by changing the sieve, from 10 mesh to 150 mesh. 300 mesh can also be had from a machine with suction.
(PFNDAI Newsletter No: 17, June 1984, 4)

1 Grinder improved

Santha Industrials manufacture a tilting type grinder for wet and dry grinding. The paste can be removed by tilting the machine without employing hands. Suitable for both domestic and industrial uses, the grinder has a stainless steel cover to prevent dust and other particles falling into the grinding media. It is available in 20, 15, 10, 5, 3, 2, and 1 litre capacities. All parts are removable and, as such can be cleaned thoroughly. For further information write to: Santha Industrials, 158 Avanashi Road, Peelamedu, Coimbatore, Tamil Nadu 641 004

(Industrial Products Finder 13(1), 1984, 17)

Rice polisher

Dandekar have developed a vertical abrasive cone polisher in four sizes -- 500, 800, 1,000 and 1,250 mm cone dia having capacities of 400; 800, 1,100 and 1,400 kg rice, per hour, respectively. Suitable for both raw and parboiled rice, the machine is offered either complete with drive motor or wet a belt pulley for driving from a counter shaft. As a result of a special

design employed for the top bearings arrangement, the centre of gravity of the cone remains unaltered when the cone is lowered or raised. The cone is thus stable in all positions and hence the breakage of rice is minimum, it is said. For further information write to: G.G. Dandekar Machine Works Ltd., Dandekarwadi, Bhiwandi, Dist. Thane, Maharashtra 421 302

(Industrial Products Finder 13(1), 1984, 110)

303 High speed disperser

Fabdecon disperser is an universal rapid mixer for dispersing, suspending, emulsifying dissolving, gasifying, homogenising and evacuating air from fluid to highly viscous mixes, and for accelerating reaction processes. The disperser finds application in chemicals, foodstuffs, plastic pastes, etc.

The disperser can be made available with hydraulic, electro-mechanical or manual mechanical hoisting methods, with carbon steel or stainless steel contact parts, in capacity ranges from 1 to 100 hp. To improve performance and to overcome the inherent low pumping capacity of such high speed dispersers, Fabdecon disperser can be provided with an additional impeller having high pumping capacity, to operate simultaneously with the saw-tooth impeller.

(PFNDAI Newsletter No; 17, June 1984, 3)

304 Hydro extractor

The Sanjay hydro extractor (of Bombay) is robustly constructed; the complete body of the centrifuge is of cast iron cladded with stainless steel. All parts coming in contact with water are of stainless steel. Being of heavy duty batch type, the centrifuge ensures gas-tight casing. The method of its operation reportedly permits easy separation of solids from liquids making the machine suitable for chemical, textile, dyestuff and pharmaceutical and food industries, which require filtration of slurries and hydro-extracts from pastes and clothes.

(PFNDAI Newsletter No; 20, 1984, 1)

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305 Dissolved air flotation clarifier

Krofta Engineering's dissolved air flotation clarifier is reportedly a self-cleaning unit which can be kept in operation 24 hours a day, 7 days a week without any shut down. Retention time is 3 min. Space and head-room requirements are therefore minimal. A 540 cm 90 cm height installation is capable of handling 1 MGD of effluents. The clarifier comes prefabricated and can be erected above ground level. No major civil works are required for installation. Maintenance expenses are minimal because the tank is completely open and the bottom is selfcleaning during operation. The clarifier is effective in food processing (dairy , oil, etc), sugar, distilleries, and others.

(PFNDAI Newsletter No: 20, 1984, 3)

306 Fermentor

New Brunswick Scientific Company of USA have developed a compact laboratory fermentor. Cells cultivated in the fermentor are contained in a 3-12 1 stainless steel pressure vessel. Used for a range of basic and applied laboratory studies, including recombinant DNA, interferon and seed culture development, the Microgen fermenter is employed in aerobic and anaerobic investigations and for the propagation of animal and plant cell suspensions. An in-line air filter, an optional inline exhaust filter and a harvest/sampling port are steam sterilised *in situ*. It is also possible to analyse and/or control pH, redox, exhaust and foam formations with suitable additions to the unit. Toshniwal Brothers (Delhi) Pvt Ltd 3E/8 Jhandewalan Extension, New Delhi 110 055

(PFNDAI Newsletter No; 24, 1984, 4)

307 Laboratory fermentor unit

Miclab Instruments have developed a laboratory fermentors unit with a capacity range from 2 to 50 litres. The compact unit with hollow baffles arrangement for maintaining the desired temperature of jar, is designed for mass cultivation of micro organism in batch fermentation and continuous culture under defined condition of temperature, aeration and agitation. Microbial cells can be cultivated under precisely controlled growth conditions The unit is suitable for production of aerobic and unaerobic bacteria, streptomycet, yeasts as well as mammalian and plant tissue culture. The single/double/triple type unit is offered to requirements.

308 Mixer for paste/cream

Dalal Engineering offer a specially designed mixer for mixing of pastes and creams. The action of the mixing blade system can be adjusted to provide fast high shear action. The mixer consumes less power and handles pastes/creams of high viscosity and/or high density in a short time. A jacket can be provided for heating/cooling. The shorter batch times not only enable higher production but also permit heat sensitive products to be handled without deterioration. The capacity of the mixer is 60 litres, and it is supplied in SS 304 and SS 316. The mixer finds applications in food/ chocolate/cosmetics/pharmaceuticals industries, and in the preparation of halwa/sweets etc.

(PFNDAI Newsletter No: 17, June 1984, 4)

309 Biscuit machinery

Biscuit making machinery is simple to operate, has few moving parts for reliability and low maintenance and can be supplied to standard design or custom built.

Small and Shattell Pty Ltd can supply individual units or full production lines with a capacity of up to 1.5 tonnes an eight-hour day according to biscuit weight.

Standard production lines begin with a mixing machine. This feeds to a dough brake and cutting machine for dry and sweet biscuits or to a wire cut machine for sweet or shortbread type biscuits. Both deliver to ovens available with most types of heating.

The company also makes specialised biscuit cutters, rotary rollers and wire cut dies for many applications and modern high craft baking systems. Mixers, dough brakes and ovens are also suitable for the general baking and confectionery industries. The equipment can be operated by unskilled labour.

The company can arrange installation, maintenance and a spare parts service wherever required.

(Australian Trading News, Sept, 1984, 7)

310 A "most unconventional" extruder

A pioneer in the manufacture of food processing extruders is now making available to the industry three sizes of twin screw (TX) food extruders.

Termed a 'most unconventional/ twin-screw extruder, this unit

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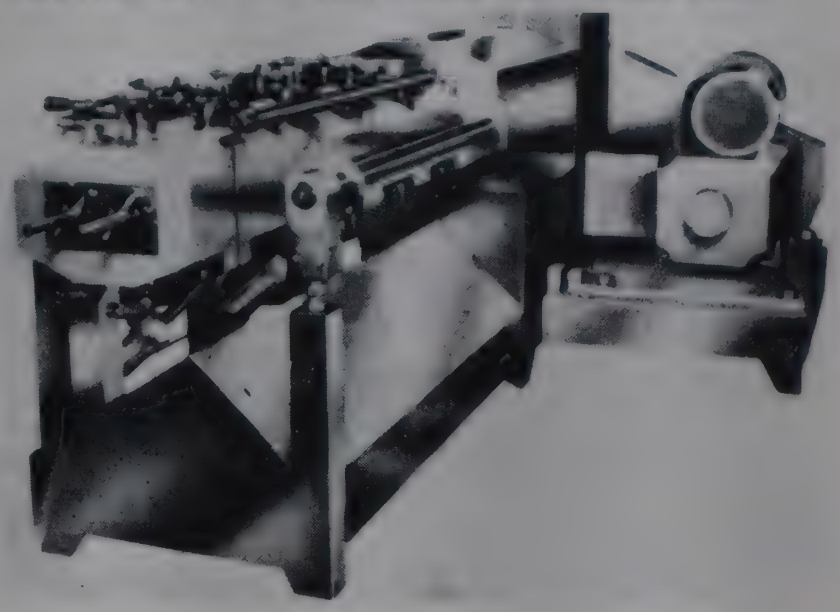
has been designed and manufactured specifically for foodstuffs. Five years of research, engineering and testing are behind this new addition to the Wenger line.



What makes this extruder stand apart from others of its type are features that promote sanitation, enhance versatility, improve output-to-energy ratios, simplify maintenance and increase the life of screw and barrel components.

The twin screw food extruders join the Wenger menu of products now composed of both monoscrew and twin screw extruders, including 10 different sizes and 23 distinct models of high and low-shear extruders for most SIC20 extrusion processing requirements — Wenger Manufacturing Sabetha, Kansas, U.S.A.1

(Food Engineering International July/August 1984, 85)

311 Cooker extruder for cornflakes

According to CL-Simon, it's going to be easier, more cost effective and less time-consuming to satisfy the world's appetite for cornflakes. The company has developed Twin Screw Cooker Extruder to make cornflake production as simple as possible.

This is not the case any longer says CL-Simon. Its Twin Screw Cooker Extruder can offer a complete system to make any desired corn-flake, using any available degermed maize grit. This gives the manufacturer a wide range of raw material to choose from, considering the spectrum of grits available on the open market at competitive prices.

With the new cooker extruder, it is possible for the processor to make a cornflake using his own newly-developed-recipe. Perhaps the processor wants a richer malt flavour or a lighter or darker colour to the flake. Maybe a smaller, or larger, flake is desired. All of this flexibility has been engineered into the cooker extruder.

Using its cooker-extruder system, cornflakes come off the manufacturing unit within 30 minutes, and no lead time before and after actual production is required.

With the CL-Simon method, fine maize grits, typically with a particle size of 250 microns, are mixed with a blend of sugar, salt and malt, then conveyed to a holding bin above the cooker extruder. The cooker extruder, operating at correct barrel temperatures and precise screw configuration, cooks and processes the grits into a dough pellet suitable to form the final cornflake.

The extrudate flows from the cooker extruder in strand form, passes along a conveyor to a pellet cutter and is cut to the desired length to suit final cornflake size. The cooked dough pellet, cut to desired size, is then conveyed either mechanically or pneumatically to the flaking roll, an assembly of two large steel rolls provided with a water chilling facility that re-shapes the pellets into very thin flakes. The control of the thickness of the flake governs the final thickness, texture and surface blister.

From the flaking roll, the flakes are conveyed to the toaster, which consists of a rotary drum mounted on bearings, through which the flakes pass for thermal processing. The toaster operates on hot air and relatively high velocities in order to achieve high heat transfer rates. The hot air is ducted to several zones along the toaster so the heat to each section can be accurately controlled. The unit has a re-circulation system to reduce energy losses and it also extracts fine dust particles. The rolled flakes entering the toaster will be reduced in moisture content to less than 3% on exit.

The toasted flakes are then conveyed to storage bins prior to packing.

A full range of CL-Simon Cornflake Cooker Extrusion capacities is available ranging from 40 lbs/hour (18 kg/hour) to 1,600 lbs/hour (726 kg/hour)

CL-Simon, Inc., Kansas City, Kansa, U.S. (In France Clextral)

(Food Engineering International, October 1984, 93-4)

312 'Papad' making machine

The sketch illustrates a simple unit to make papad in large numbers say, 1,500-4,500 per minute. The main drum is power driven at a slow speed and is heated by an electric heater. The raw material is fed through the inlet hopper in a paste form. The rotating drum carries a film of the raw material, the thickness of which is controlled by a wedge. A cutter

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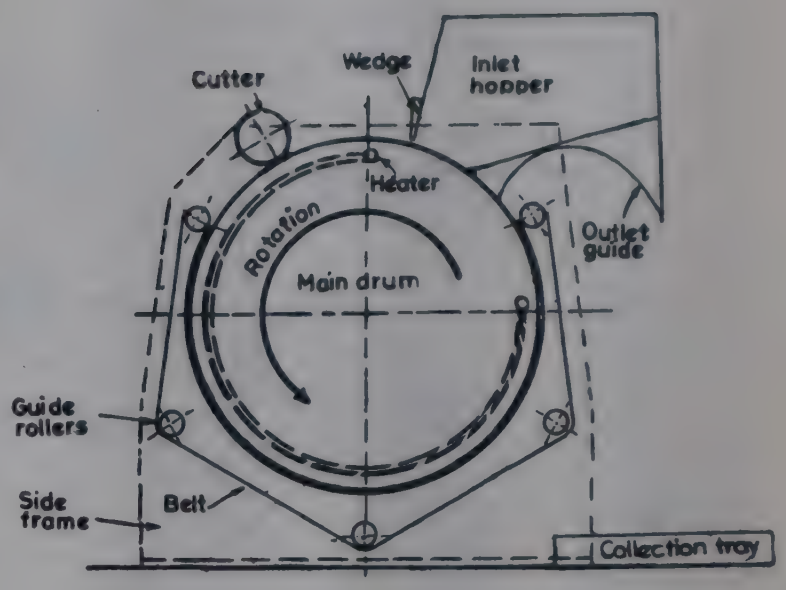
is provided in contact with the main drum at a suitable distance from the inlet hopper.

The film is dried under compression between the drum periphery and an endless canvas belt. The dried papad is collected through an outlet guide in a collection tray. Dryness can be controlled by varying the temperature and speed of the main drum.



Papads of square shape will not have any wastage. However, if round shape is preferred a wastage of about 22% should be taken into account.

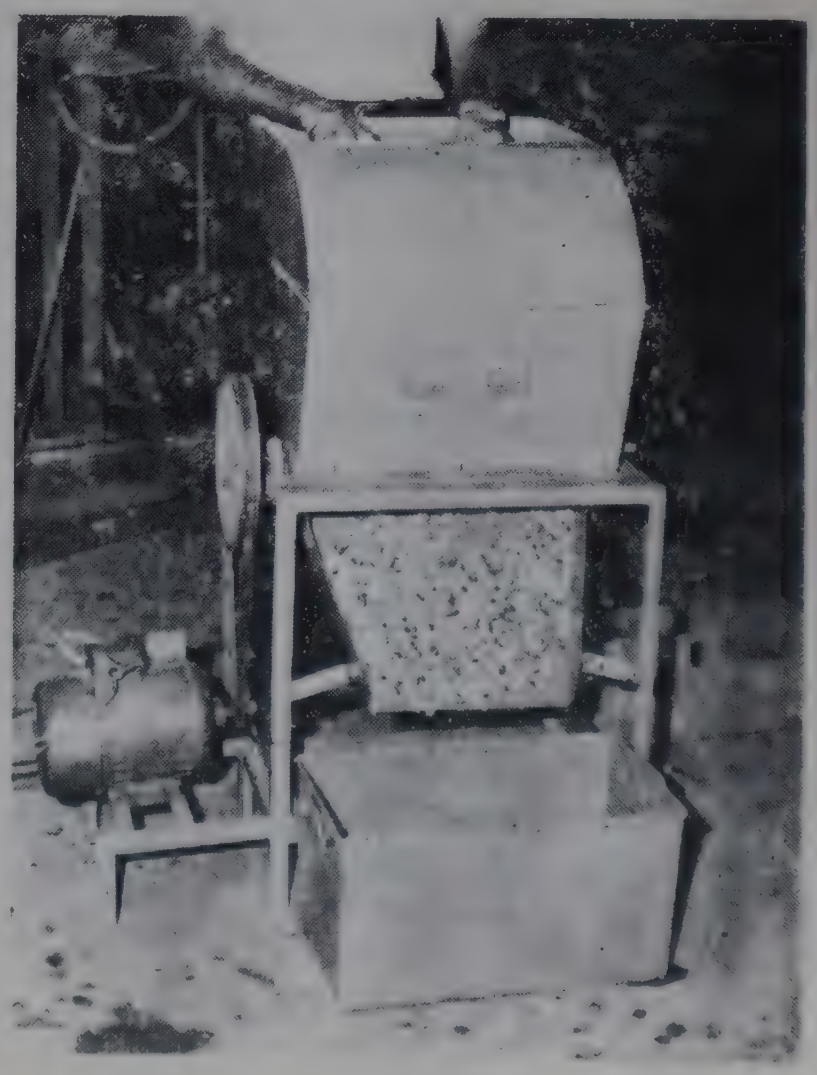
The main advantages of the device are uniform and speedy output, simple construction and mechanical operation obviating manual labour. Contact Mohan Laxman Tambe Brahmalmkhit Bangalow Pavanagar Society plot No.61 Chinchwad Gaon, Pune 33

(Invention Intelligence 19(3), 1984, 135-6)

313 A device for vegetable seed extraction

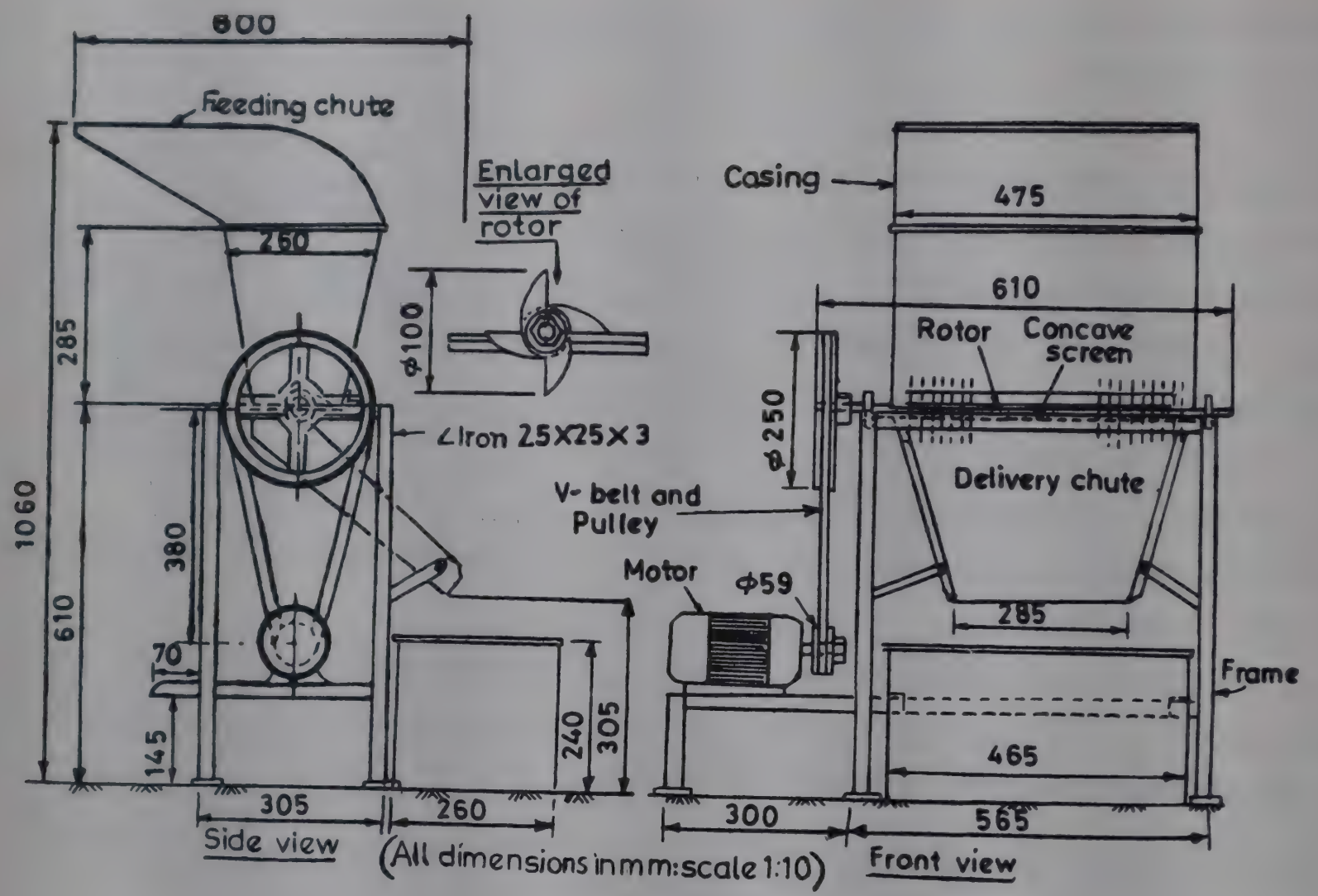
Describes a simple and low cost mechanical device for extracting seeds from various vegetable, fruits like brinjal, tomato, cucumber, watermelon, tinda and ashgourd.

The constructional details of simple low cost vegetable seed extracting machine are shown in Fig 1 & 2.

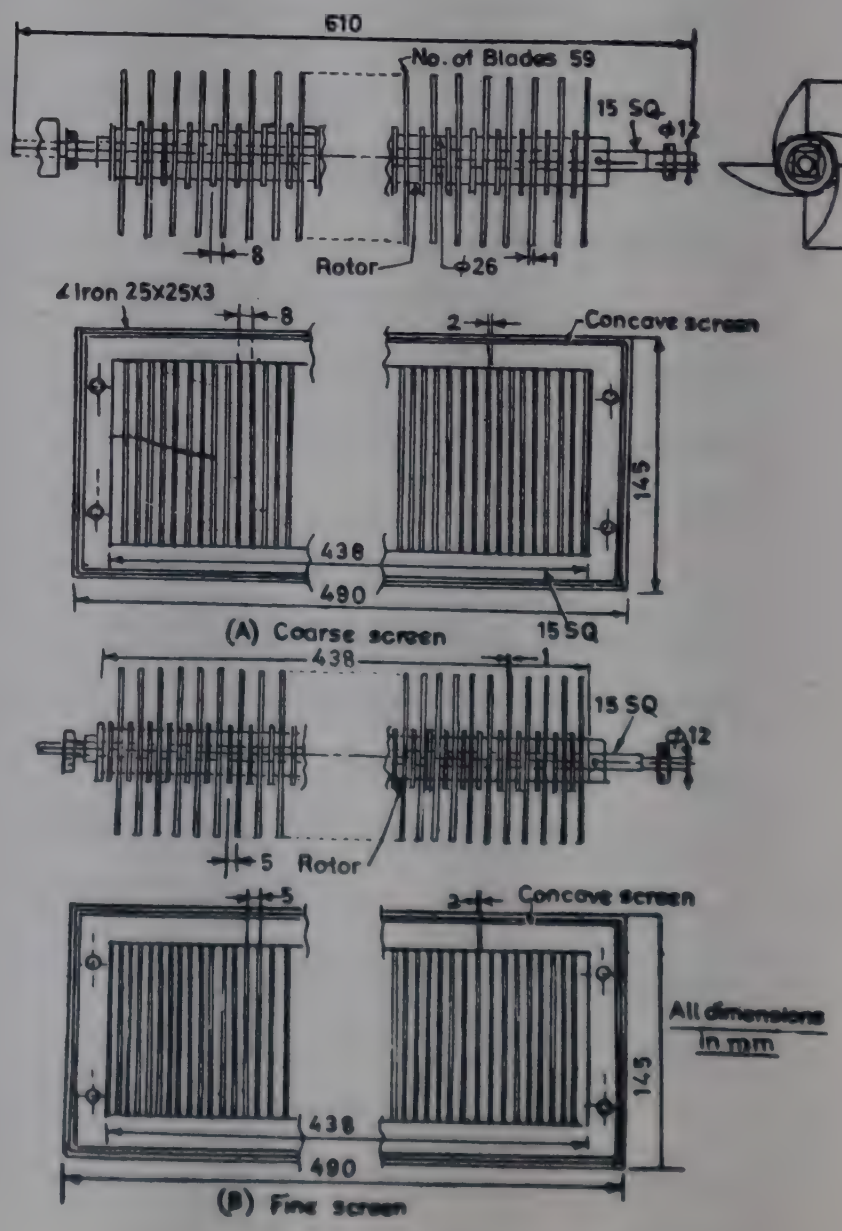


This machine essentially comprises an angle-iron frame, equally spaced sharp steel blades mounted on a rotor, concave screen, rotor casing, feed trough, delivery chute, collecting trough, belt and pulley drive, and a 1 hp single phase electric motor.

The working principle of this machine is rather simple. The rotor revolves at a speed of about 250 rpm



The ripe fruits are fed through the feeding chute. To extract the seeds without causing any injury, the spacing between the blades and the concave screen was worked out through repeated trials. The efficiency of seed extraction by the new device is considerably higher than that of the manual extraction method. The feed trough and casing have been so designed that no spilling of the pulp or skin takes place. The material is crushed quite effectively but the seed damage is excluded. The seeds are separated from the pulp soon after crushing.



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Specifications

The specifications of the vegetable seed extracting device are as follows:

1. Overall length	865 mm	8. Length of concave screen	490 mm
2. Overall width	600 mm	9. Width of the concave screen	145 mm
3. Overall height	1060 mm	10. Diameter of driving pulleys mounted on rotor shaft	59 mm
4. Length of rotor	438 mm	11. Diameter of driven pully mounted on rotor shaft	250 mm
5. Diameter of rotor spacer	26 mm	12. Size of trough to crushed material Length	465 mm
6. Diameter of blades	100 mm	Breadth	260 mm
7. Spacing between blades	8 mm	Height	240 mm
		13. Total weight of the machine	50 kg with motor; 35 kg without motor
		14. Horse-power of driving motor	1 hp

(Invention Intelligence 19(4), 1984, 181-185)

14 Tomato pulp extraction

Vettori Manghi & C. SpA. 43100, Parma. Natural tomato pulp, with the addition of concentrated juice, is "becoming more and more popular on the market" a Manghi spokesman says. The company offers a plant technically advanced and especially designed to obtain a pulp with high quality characteristics as compared to ordinary granulometry, consistency, purity and taste standards.

The processing capacity of this plant ranges from 5 to 10 tons/hour of incoming fresh product and it delivers a constant yield said to be higher than 60% of drained pulp ready for filling.

Usually, says Manghi, it is possible to obtain a consistent pulp without peel, seeds and green parts, with a small juice outlet and this, processing industrial type unpeeled tomatoes.

The following operations are completed in this plant: Scalding, slicing, seed separation and depulping. During depulping, slices pass between a rotating drum and a pressure cylinder, producing a uniform pulp, which then goes on to the filling section.

All metal in contact with the product is fine stainless steel (AISI 304). And each machine for any single operation, has its own frame placed on a central scaffolding with access stairs.

(Food Engineering International Oct 1984, 54, 57)

315 Tomato evaporators

Brighton Corporation, a U.S. company, used Interpack as a format to introd its full line of tomato evaporators.

The line of tomato evaporators, as well as other products in the company's lines, feature the exclusive, patented Bright-On electropolish finish. The electropolishing process involves smoothing a metal surface electrochemically in a concentrated acid or alkaline solution. The result is the erosion and dissolution of microscopic surface high points, scratches, grit lines and coars projections, thus giving a smooth surface. This finish provides greater heat reflectivity and the finish cannot chip, crack, flake or peel.

Bright-On's most significant advantage, however, is the savings to be realized from reduced downtime for cleanup. The surface is rendered bacteriologically cleaner than a mechanically polished surface and the process's high release properties ensure quick and thorough cleaning between batches.
(Food Engineering International, July/August 1984, 70)

316 Portable sugar mill

An Australian firm offers a low cost; low-technology portable sugar mill which solves many of the logistical and financial problems usually associated with small-scale cane crushing. The F.H. Goodworth and Company claims that the Goodworth micro mill is not just a scaled down version of a full size factory, but an application of modern milling technology designed for village economies based on as little as 40 hectares of cane fields. Cane is hand fed through a sloping chute which guides an even supply through a series of eight crushing rollers according to a report in the Regional Centre for Technology Transfer bulletin from Bangalore. The first stage of crushing removes about 60 per cent of the can juice. Crushed cane is then reduced to fibre by a high speed shredder and washed by juice before passing through a final three roller crusher Hot water is added before this final stage to remove all but the last 5 to 10 per cent of sugar in the cane. This process, called imbibition, gives results equivalent to big mill performance. The mill is said to have its own boiler for clarification and evaporation. The boiler design has been adapted from those used in steam cars so it is compact and safe. Steam is generated by burning bagasse or other low grade fuel such as sundried saw dust.
(Mechanical Engineering Bulletin 14(3), 1983, 92)

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317 Cooking range

Fusebase India Pvt. Ltd 240, Ram Nagar, Krishnan Nagar, Delhi 110 051 has introduced a cooking range, which is the first of its kind in India.

It has four burners on top for cooking. It has grill chamber and an oven of dm. raised to three capacity; it has a storage drawer-cum-dish warmer-cum-food warmer. It incorporates an imported timer having time setting from zero to 60 minu The oven chamber temperature can be controlled steplessly from 140 to 305 C. It has a top lid-cum=splash guard.

The cooking range carried the ISI certification mark. It is priced at Rs. 4, plus taxes.

(Financial Express 2 December 1984, 6)

318 2-Step solar cooker

The National Institute of Oceanography has developed a box type solar cooker measuring 50 cm x 50 cm x 35 cm and weighing 35 kg. The unit is provided with 2 shelves and four blackanodised Hindalium containers for cooking. Soft food items like fish, rice, etc-can be placed on the lower shelf while hard items like pulse are placed on the upper shelf. It takes on an average about 1 1/2 hours to cook 700 g of rice and pulses at a time.

Some of the salient features of the cooking device are: 1. All the component are of indigenous material and even rural artisans can fabricate the cooker; 2. It is portable; 3. It is capable of cooking most of the common food; 4. The cooker can be used in co-ordination with conventional devices which do initial fr and the rest can be done by the cooker, thereby conserving fuel. This solar cooker, costing approximately Rs. 300/- each is convenient particularly for field workers.

(Cardamom 17(9), 1984, 16)

319 Heat recovery systems

Bry-Air (India) feels proud in being instrumental in bringing you the heat pipe based heat recovery systems for the first time in India. The heart of these industrial and commercial heat exchangers is 'heat pipe.

A heat pipe is a super thermal conductor that transmits heat by the evaporat and condensation of a working fluid and can transfer upto 1,000 times more heat energy than copper, one of the best known conductors with a temp drop of less tha 30 F per ft. These heat exchangers can recover upto 90% of exhaused energy and p back the initial cost within to 18 months. The exchanger are tested and desig ed

to give excellent performance ranging (-) 50 F to 600 F. Minimum maintenance because of no moving parts and zero operational cost since no power is used make it an ideal choice for wide and varied applications such as all types of dryers, ovens Kilns and Boilers Exhausts and Chemical Dehumidifiers. All building HVAC exhausts, industrial plants, hospitals, laboratories and institutions can use it gainfully. For further enquiries, contact: Arctic India Sales, 20 Rajpur Road, Delhi 110 054.
(Seminar Reporteur 14(10), 1984, 34-5)

320 Solar crop dryer

Researchers of the Annamalai University at Chidambaram have developed the prototype of a solar crop dryer capable of drying one tonne of paddy a day.

Fabricated with inexpensive and commonly available materials, the device helps generate hot air upto 60 degree C which is blown into the paddy stack.
(Financial Express 26, Wednesday September, 1984, 3)

321 Spray dryer

Filtron India have developed a spray dryer which eliminates filtration drying, pulverising and powder separation. The spray-dried products are said to have uniform size, and excellent solubility, dispersion and distribution. The automatic unit can handle heat sensitive and degradable products due to the low temperature involved in the drying operation.
(Industrial Products Finder 12(12), 1984, 51)

322 AIT Solar Dryer can take 1.2 tons rice or other produce

The Bangkok based Asian Institute of Technology has developed a low-cost solar rice dryer which can be fabricated by the farmer himself using locally obtainable materials. The dryer can also be used for produce such as pepper, corns, shrimps, chillies, and coffee beans.

It has three main features: a solar receiver, a rice bed and a chimney.

A dryer having a capacity to dry 1.2 tons of rice at a time would have the following measurements for each of its components:

The solar receiver has an area of 6.0 x 6.6 metres, covered with burnt rice husks of 1.3 cm. thickness. This area is then covered with clear PVC sheet of 0.15 mm thickness. An air inlet is created by leaving the front uncovered to all air inflow, with the inlet between 10 and 15 cm above the ground.

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The rice bed is contained in a shallow box 1.5 cm x 6.29 cm elevated about 90 cm above ground. The bottom of the box is made of 323 washing woven bamboo lined with nylon netting, and its sides and roof are covered with clear PVC sheet. Two removable panels at the back allow the operator to load and unload the paddy.

The chimney consists of bamboo frame of 1 inch diameter. Cross-sectionally, the chimney forms an equilateral triangle with 50 cm sides. The chimney is 2.2 metres above the roof of the rice bed and should be covered with a dark coloured plastic sheet to absorb heat from the sun.

(Asean Food Handling Newsletter No: 13, July 1984, 9)

323 Bottle washer

Kerry rotary bottle washing machines are manufactured by Kerry Jost Tools Limited, Madras, for distilleries, breweries, beverage manufacturers and pharmaceutical industries. They are designed to clean bottles of various sizes by a series of distinct processing operations. They have a maximum output of 4,800 bottles per hour at a 1.5 minute cycle time. The output capacity will vary with the washing cycle time.

Bottles which are lower than 180 ml., in size can also be washed with special bottle holders to suit different sizes of bottles. Washing is by means of powerful water jets in four different sections of varied durations.

These washing machines are made with washing area of stainless steel or mild steel, depending upon the application. The design of the machine ensures easy accessibility for maintenance. For further information, contact Kerry Jost Tools Limited, Great Social Building, Sir Phirozeshah Mehta Road, Bombay 400 001

(Seminar Reporteur 14(10), 1984, 33)

324 Bottle washer saves energy and manpower

A new, fully automatic bottle cleaning and delabelling machine can save energy and manpower for beverage manufacturers.

The machine, a Newsmith Stainless Vantage soaker hydro, washes 45 dozen, 40z and 40oz bottles/hr and is said to be the first stainless steel continuous motion bottle washer with automatic label extraction.

Labels are removed by heavy-deluge water jets, extracted from the washing liquor by a rotary filter, and ejected into a disposal bin.

Economical energy use is achieved by double-skin side panels which mini heat losses from the machine's steam-heated liquor tank.

These bottle washers can be 'tailored' to suit any bottling plant. Dou end types can be supplied for situations where customers find it more conven to site the dirty bottle infeed and clean bottle discharge stations at oppos ends of the machine

Pre-rinse and pre-soak treatments can also be built into the washing se as can a variety of rinsing treatments to suit the brewing, milk and soft dr trades. Contact Betts Engineering Ltd, 166 Railside Ave, Henderson, Auckla New Zealand. Ph 836-0069.

(Food Technology in New Zealand 19(3), 1984, 19)

325 Industrial mask

Questors of New Delhi manufacture a range of masks to prevent mineral a industrial dusts from entering the lungs of workers employed in sugar mills, flour mills, and other similar industrial units. The Facial Gauze Mask is m of a soft plastic material which covers the nose and the mouth and thus prov complete protection even if the worker breathes through the mouth. The elas bands lock behind the neck and hold the filter in place. The velcro tape fixed at the ends of the elastic bands allows the length of the bands to be increased or decreased. The filtering mechanism lies in the chamber in fron

(Industrial Products Finder 13(1), 1984, 101)

PACKAGING

326 Release papers

Pyloff food grade release papers, board and film help even stickiest ma coming away easily and the benefits are numerous: waste is reduced, handling speeded, production delays are minimized. The product is suitable for bakin cakes, pastries, bread, hardling toffee, jellies, candies, dates, etc. The exhibits the property of non absorbency, is permanently coated with smooth, migratory, transparant coating. It saves fat loss and crust loss and ensure shape from the mould of product being baked or manufactured.

(PFNDAI Newsletter No: 17, June 1984)

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Wrapping machine

Nichrome Metal Works manufacture the Flowpack horizontal form fill and seal machine for wrapping a variety of products in pillow type pouches. The product is placed on a horizontal conveyor. Paper is drawn from a lay-flat film roll and pulled through a pair of heated rollers to form a tube over collars or forming shoulders. The product is inserted in this longitudinally sealed tube, and transverse sealing takes place on a sealing station with a bag cut-off arrangement. Stepless bag length adjustment up to 400 mm is performed through a handwheel. Bag width and height can be adjusted up to 200 and 140 mm respectively, by changing the forming shoulder. Up to 150 units can be packed in a minute, depending on the product and the film used. The machine requires 4,400 x 1,000 mm floor space, and 2 KVA power. It can pack biscuits, chocolates, sausages and cakes, sanitary towels, sterilised syringes, match-boxes, soaps, toothpastes and stacks of tissue paper; and ball bearings, spark plugs, cigars, welding electrodes etc. For further information write to: Nichrome Metal Works, 46 Dr. Ambedkar Road, Pune, Maharashtra 411 001

(Inaustrial Products Finder 12(12), 1984, 37)

Packing costs cut by 75 per cent

Extensive field trials are underway in the pacakging and transporting of oranges, conducted by the Directorate of Marketing and Development, Government of India, which is of the view that wire-bound boxes and plastic field crates are better than the conventional wooden boxes. in terms of economy and profitability to growers.

A truck load of oranges, in the improved crates arrived recently in the city from Nagpur.

The consignment is being marketed through the Bangalore Horticultural Producers Marketing and Processing Cooperative Society.

The wire-bound boxes and plastic crates it is said are easy to handle and pack resulting in the reduction of packaging costs by 75 per cent.

The cold-storage trials for quality assessment of these boxes are in progress here. Initial trials have shown that the quality of fruits stored in plastic crates are better than when stored in other boxes.

These trials in cold storage of fruits mark a breakthrough.

(The Hindu 29 November 1984, 12)

329 Seamless containers

Metal Box has claimed the position of manufacturer of the U.K.'s first nestable metal containers for litho printing inks. The Nestacan, made from tin-free steel, is a deep drawn, seamless container suitable for either vacuum or ambient packaging.

The tapered construction of the can permits empty packs to "nest" into each other. The 3°taper gives a nesting factor of about 10-1 which means a saving of up to 90% on transit and storage space for empty containers, says the company.

The can has been designed to be particularly suitable for products which a sensitive to the effects of oxygen or water vapour likely to be affected by leg lation governing carriage of dangerous goods, or for products requiring a secur tamper evident closure.

A compound lining in the lid holds the vacuum, ensuring protection against products skinning or hardening. The lid is crimped on to provide a secure and tamper-evident seal. A specially designed patented top curl and a restraining bead give the pack exceptional strength and rigidity.

Nestacan comes in a 1 kg and 2.5 kg size. The container and base can be custom decorated to customers' own designs. The lid can be embossed as well as decorated.

Although designed especially for the printing ink industry this new can fi a variety of needs for manufacturers of paste and semi-viscous products in the industrial and household field. It is especially suitable for adhesives, sealants, mastics, fillers, dry bulk pharmaceuticals and food products such as ice cream, preserves and confectionery that would benefit from being vacuum pac A handling and filling system is available to go with the Nestacan -- Metal Box P1.c., Reading, England.

(Food Engineering International Oct 1984, 102)

330 Flexible nylon film

Nypel products have developed a flexible film, the Nypel 1-6, of 20 to 50 micron thickness in layflat tubing width of up to 600 mm. The film is claimed possess excellent mechanical strength, high oxygen and gas barrier properties, temperature resistance from-40 to +150 C, and resistance to organic and inorga chemicals, especially oils, greases and fats. The film can be adhesive bonded heat sealed, and is suitable for direct filling and packing of hot and molten

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which give off a smell coffee, tea, agarbattis, etc. Processed foods, cakes, pickles and savouries are said to have an extended shelf life when packed in the film. The product is available in glossy, transparent form or in standard colours; and comes in roll and sheet configurations. Nypel products. P.O. Box 239 Vadodara 390 001 (Gujarat)
(PFNDAI Newsletter No 24, 1984, 1)

331 Large scale vacuum packing

Packing of powdery and granular products in small quantities under vacuum has become a regular practice now. The air is evacuated after the bags are completely filled. The very long bagging cycle required by this packaging and preservation technique has stood in the way of its adaptation to large-scale packaging (100 kg or more). Moreover, for substances in powder form, there is th added difficulty of creating the vacuum without letting the contents get sucked u As for conservation, the special silos constructed till today for protecting thousands of tonnes of rice, coffee, or cocoa in bulk from rot and rodent pests a hardly satisfactory. Apart from being costly, these installations can keep the foodgrains only for a few months, and necessitate insecticide treatment of the products.

In contrast to the conventional methods, the bag filling process developed by the French company Vacuum Capatainer International (VCI) takes place after the vacuum is created. The result, Bagging time is considerably reduced, for produc handling becomes much easier. Because of this, it is possible to use large-volum packages of several hundreds of liters. Another interesting feature, the vacuum bagging machine forms a single unit with the extruder. Thus, from the extrusion the parison to ejection of the filled and sealed bag, less than three minutes are required. The complete unit can package about 100 000 tonnes of products per yea depending on the density.

The process developed by VCI preserves perishable foodstuffs for at least th years against any weather (between -60 to +60 C) harmful gases and chemical agents Every package comes with its own polyester straps for handling which can be done conventional lifting systems.
(Scientific News from France July-Aug 1984, 11)

332 Oxygen-free packs adapted for coffee

Two new packaging processes for protecting oxygen sensitive food are on the market from Hesser.

Both work on the principle of reducing oxygen content during the packaging operation rather than beforehand.

With the oxygen displacement system by the 'neutrafill' principle -- by means of inert gas injection, either nitrogen or carbon dioxide gas -- oxygen and water vapour are removed during the filling or weighing process. This oxygen and water-vapour free condition of the product is maintained until the final air-tight sealing of the package is achieved.

With the evacuating and gas-flushing system on the Vacufin principle, oxygen is removed from the package by vacuum pumps. Subsequently, an inert gas is introduced into the vacuumised package prior to sealing.

Freshly roasted coffee generates a considerable amount CO_2 gas within seven to 11 days while staleness and deterioration are detected within six to eight weeks.

To protect the product from becoming stale over a longer period, a package concept evolved which permits gradual degassing while preventing air from entering and oxidising the coffee.

(Food Technology in New Zealand 19(1), 1984, 24)

333 Packaging for wine

A new design in a multipack, the JAK-ET-PAK features a carrying handle that is easy on the hand, does not have any sharp edges and makes the wine pack safe and easy for the consumer to carry. The multipack was specially developed to hold 2 x 2 or 2 x 3 bottles of wine. The attractive, unusual appearance of the new wine pack and its easy stackability offer you strong shelf impact and identity.

With the JAK-ET-PAK fully automatic packaging is possible. Two-piece blanks are delivered flat and are processed on a machine specially designed by 4P for this purpose. The machine is capable of producing up to 50 packs/minute and it takes just under 10 minutes to change the machine to a different formation. The multipack features a special extra section to hold the bottles securely in place.

(Food Engineering International July/August 1984, 84)

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334 Neutral aseptic system

From the French company ERCA comes an entirely natural sterilization process utilizing no chemical agents to complete the process. The system offers packaging of a sterile product, using sterile materials, inside a sterile chamber, decontaminated solely by heat (using temperatures of up to 160 C for 15 minutes).

The neutral aseptic system (NAS) uses a thermoformable material, a co-extruded complex consisting of up to seven layers (supplied by Cobelplast of Belgium), which is bacteria free since it is manufactured at a temperature of atleast 200 C.Coming off the line it is protected with a peelable polypropylene film, which is removed by delamination when the reels are fed into the sterile chamber in which forming, filling and sealing of the cups takes place.

Depending upon the model and size of containers being used, output of the system is between 5,000 and 50,000 cups per hour. The machines are fully automatic, self-monitored by an integrated electronics system and may be connected to a CIP cleaning installation, if desired.

(Food Engineering International Oct 1984, 37)

ANALYSIS

335 Continuous process refractometer

The Model 31 differential refractometer, manufactured by Anacon (Instruments) Ltd. of UK, is a highly sensitive, optical electronic instrument, used in industry to measure and control the concentration of various chemical substances in liquids. The area of applications in chemical, petroleum and food processing includes confirming or identifying substances analysing mixtures and process streams and estimating properties of polymers such as molecular weight, size and shape. The refractometer comes in either standard or explosion-proof version. For further information write to: Toshniwal Brothers (Hyd) Pvt. Ltd. 4th Floor, Moghul Court, Deccan Towers, Basheerbagh, Hyderabad, Andhra Pradesh 500 001

(Industrial Products Finder, 12(11), 1984, 29)

336 Ion Chromatography

This is an analytical technique for the determination of common anions, mono- and divalent cations, transition metals, carbohydrates, alcohols, polyphosphonates, amines, amino acids, organic acids, and sulfonic acids. A 12-p brochure describes the unique features of the Dionex Series 2000i Ion Chromatographs, including design considerations analytical column technologies, and patented post-column chemistries. Major benefits of these systems are illustrated with 27 actual chromatograms taken from a broad range of sample types. The dionex approach to system modularity is also described. For a copy of the brochure, contact Dionex Corporation, 1228 Titan Way, P.O. Box 3603, Sunnyvale. CA 94088

(Food Technology 38(7), 1984, 94)

337 LC column for aromatic acids

This is capable of separating a variety of weak organic and aromatic acids using only dilute acid as the eluent. The ARH-601 column also provides fast and efficient separation of numerous strong acids using the same eluent. A chemically inert polymeric packing material stable from pH 0-14 is packed in stainless steel columns for use with any modern liquid chromatograph. Acid formed from respiration and fermentation processes are separated in only a few minutes in this column without elaborate sample preparation or derivatization. For further information, contact Interaction Chemicals, Inc., 1615, Plymouth Street, Mountain View, CA 94043

(Food Technology 38(7), 1984, 98)

338 Osmometer/milk cryoscope

Advanced Instruments Inc. of USA manufacture an osmometer for determining the concentration of solute particles by measuring the freezing point depressi of the aqueous solvent. Available in single and multi-tube models, the equipment finds applications in pharmaceutical, processed food and chemical industries. It can also be used by starch manufacturers for determining dextrose equivalent. Another version of the equipment is a cryoscope which determines the water content in milk and soft ice-creams, and hence finds applications in dairies and ice-cream producing unit. For further information write to Suvik Electronics Private Limited, Plot 88, Sector 19, Gandhinagar, Gujarat 382 019

(Industrial Products Finder 12(12), 1984, 87)

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39 Stevens C.R. Analyser for Tenderness

An accurate, versatile electronic compression tester/penetrometer has been introduced by Stevens Laboratory, Division of Dolphin Yard, Holywell Hill, St Albans, Herts ALI IEX. The compression tester, known as the Stevens C.R. Analyser, performs all the conventional tests used in the industry we are told. It can be fitted with all of the recognised food testing probes, such as the Kramer Shear Cell, the Volodkevitch Bite jaws, the Ottawa Cell and the Meat Shear Cell. Currently, it is being used for testing the tenderness of poultry meat using the Volodkevitch jaws, the texture of sausages using the Kramer Shear Cell and the texture of beef burgers using a specially designed punch. Good results have also been obtained in evaluating the tenderness of sirloin steaks. The C.R. Analyser is microprocessor - controlled and, using just four controls, virtually every conceivable compression test can be carried out.

(Food Trade Review 54(3), 1984, 140)

40 Room Size calorimeter built at USDA laboratory

A human calorimeter has been constructed by U.S. Department of Agriculture (USDA scientists at the Beltsville, Md., Human Nutrition Research Center. The new calorimeter is reported to be the first room-size unit in the United States to combine direct and indirect calorimetry to measure energy produced by metabolizing food in the human body. The calorimeter looks much like a large, walk-in refrigerator with two windows. Sensors in the walls and in the air flowing out of the calorimeter provides direct measurements of heat given off through the skin of the person inside. Indirect calorimetry is used to measure the normal decrease in oxygen and increase in carbon dioxide in the air caused by breathing and the amount of urea in waste products

Measurements will be used to calculate the amount of food or body tissue used to produce heat. Ideally, the direct and indirect methods should agree closely. To gathe all the data, a computer will continuously monitor the temperature sensors, and a mass spectrometer, under the computer's control, will constantly compare the percentages of oxygen, nitrogen and carbon dioxide in the air entering the chamber and in the air coming out.

The calorimeter is comfortably heated and well lighted to keep the living conditions in the chamber as close to normal as possible. Volunteers will stay in the chamber from two days to two weeks depending on what foods and exercise patterns are being studied. A volunteer may bring books, magazines, and similar materials, althou television sets will not be permitted inside because of the heat they produce. Clothi and furnishings in the chamber have to be light weight so as not to block heat radiating from a person's skin.

41 All India final estimate of food grain production 1983-84

(Production in 000 tonnes)

States	Rice	Jowar	Bajra	Maize	Ragi	Small millets	Wheat	Barley
Andhra Pradesh	8,567.7	1,082.8	350.1	500.6	256.4	219.8	9.9	-
Assam	2,540.0	-	-	10.9	-	4.0	121.0	-
Bihar	4,983.2	5.2	7.6	950.1	104.4	58.6	2,750.0	64.5
Gujarat	754.3	582.0	1,607.2	475.6	49.1	79.9	1,627.0	9.8
Haryana	1,325.0	20.0	552.0	70.0	-	-	4,476.0	101.0
Himachal Pradesh	111.5	-	-	588.6	7.1	11.5	254.0	30.5
Jammu & Kashmir	569.4	0.1	8.0	285.4	-	10.1	226.1	7.2
Karnataka	2,196.3	1,899.4	287.7	472.6	1,570.7	149.5	206.5	-
Kerala	1,242.8	0.5	-	-	1.1	1.6	-	-
Madhya Pradesh	4,741.8	1,961.1	124.9	1,109.7	6.0	382.2	4,092.7	173.8
Maharashtra	2,456.4	4,678.4	908.0	145.5	240.9	110.7	1,142.1	7.9
Manipur	255.1	-	-	10.4	-	-	-	-
Meghalaya	131.2	-	-	22.6	-	2.7	4.6	-
Nagaland	128.0	-	-	14.6	-	-	-	-
Orissa	5,047.5	27.8	6.4	170.0	244.0	178.0	121.0	-
Punjab	4,536.0	1.1	54.0	538.0	-	-	9,419.0	94.0
Rajasthan	217.5	591.1	2,456.6	1,228.7	-	22.2	3,451.2	431.1
Sikkim	13.6	-	-	38.0	3.9	-	12.4	0.9
Tamil Nadu	4,447.9	540.0	391.7	58.7	278.3	245.9	0.3	
Tripura	399.7	-	-	-	-	-	6.0	-
Uttar Pradesh	6,790.9	538.3	857.9	1,119.9	204.6	212.7	16,255.3	841.6
West Bengal	7,940.4	0.4	0.2	79.9	9.0	4.3	854.2	24.0
Andaman & Nicobar Islands	22.0	-	-	28.2	-	-	-	-
Arunachal Pradesh	106.0	-	-	-	-	17.3	4.2	-
Dadra & Nager Haveli	18.0	0.5	-	-	4.5	0.5	0.3	
Delhi	6.2	4.9	8.5	0.2		-	113.8	1.0
Goa, Daman & Diu	124.1	-	0.4	-	7.8	-	-	
Mizoram	36.7	-	-	5.5			-	
Pondicherry	59.3	0.2	3.1	-	3.6	0.3	-	
TOTAL	59,768.5	11,933.8	7,624.3	7,923.6	2,991.4	1,711.8	45,147.6	1,787.3

All India final estimate of pulse production 1983-84

(Production '000 tonnes)

States	Gram	Tur	Black gram	Green gram	Horse gram	Lentil	Peas	Khesari	Moth bean	Others	Total
dhra Pradesh	23.0	73.5	132.1	221.4	76.3	-	-	-	-	6.4	532.7
sam	2.0	7.7	-	-	-	-	-	-	-	41.0	50.7
har	141.3	94.5	46.8	68.9	34.8	97.4	19.2	189.3	-	10.0	702.2
jarat	117.4	205.3	29.9	132.8	-	-	-	-	44.3	29.0	558.7
rayana	315.0	16.5	6.2	7.0	-	9.4	4.1	-	0.5	14.3	373.0
machal Pradesh	1.0	-	3.0	-	0.8	-	-	-	0.1	7.8	12.7
ammu & Kashmir	0.4	-	9.3	5.1	0.6	0.3	2.0	-	10.7	2.7	31.1
arnataka	75.0	151.2	16.4	63.0	258.2	-	-	-	-	30.5	594.3
erala	-	0.1	1.8	1.4	12.5	-	4.5	-	-	1.1	21.4
adhya Pradesh	1,455.1	474.5	218.0	74.1	58.1	138.9	39.5	222.6	-	4.1	2,685.0
aharashtra	211.9	487.0	186.7	170.3	94.5	4.7	4.8	26.0	45.8	26.1	1,257.7
anipur	0.1	-	-	-	-	-	-	-	-	1.5	1.6
eghalaya	0.1	1.0	-	-	-	-	-	-	-	1.0	2.1
agaland	-	-	-	-	-	-	-	-	-	1.9	1.9
rissa	24.3	87.3	225.8	376.0	155.2	-	-	-	-	131.5	1,000.1
unjab	57.0	35.7	7.1	26.0	-	6.5	3.0	-	1.1	0.2	136.6
ajasthan	1,088.8	14.3	86.9	92.8	-	12.4	11.2	-	302.4	50.2	1,659.0
ikkim	-	-	-	-	-	-	-	-	-	7.0	7.0
amil Nadu	7.0	69.7	70.3	30.1	63.0	-	-	-	-	14.6	254.7
ripura	0.2	0.3	0.5	0.2	-	0.2	0.2	-	-	0.9	2.5
ttar Pradesh	1,177.8	690.1	46.2	74.0	-	219.0	274.7	-	0.3	-	2,482.1
est Bengal	56.7	30.3	57.9	8.5	3.0	42.4	1.0	43.6	-	1.4	244.8
ndaman & Nicobar Islands	-	-	-	-	-	-	-	-	-	0.3	0.3
runachal Pradesh	-	-	-	-	-	-	-	-	-	-	-
adra & Nagar Haveli	0.1	1.0	1.3	-	-	-	-	-	-	0.3	2.7
elhi.	0.8	-	-	-	-	-	-	-	-	0.6	1.4
oa, Daman & Diu	-	-	-	-	-	-	-	-	-	-	-
izoram	-	-	-	-	-	-	-	-	-	0.7	0.7
ondicherry	-	-	0.7	0.4	-	-	-	-	-	-	1.1
TOTAL	4,754.9	2,440.0	1,146.9	1,352.0	757.1	531.2	364.2	481.5	405.2	381.0	12,618.1

(Directorate of Economics and Statistics, No 1-1 (iii)/83-84-AS (E)-ES dated 25-9-84)

343 Cardamom Production

The production of Cardamom during 1983-84 was severely affected by the unprecedented drought experienced in the plantation areas. Based on the trend in sales at auctions the revised estimate of production for 1983-84 is placed 1600 M.T. with state - wise break - up as follows:

State	Production (M. T)
Kerala	1100
Karnataka	400
Tamilnadu	100
TOTAL	1600

(Cardamom August 1984, 25)

344 Rise in milk production

The milk production has recorded a growth rate of 4.6 per cent per annum during the decade 1973-83 as compared to 1.1 percent during the preceding deca In 1983-84, milk production is expected to exceed 36.2 million tonnes, registe an increase of 1.5 million tonnes over the previous year's production. The Operation Flood-II Project also made further headway and by December 1983, 25 States and Union Territories had signed the necessary agreement with the India Dairy Corporation for implementation of the Project.
(Agricultural Situation in India 39(1), 1984, 30)

345 Subsidy for iodised salt

All private salt manufacturers who undertake iodisation of edible common salt, will get a government subsidy. This was decided at a meeting of the representatives of the Departments connected, with the production,distribution and iodisation of common salt, held under the presidentship of Miss Kumud Joshi, Union Deputy Minister for Health and Family Welfare.

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This follows the decision taken by the Ministry of Health and Family Welfare to iodise all edible salt by the end of the Seventh Plan period to prevent goitre.

The United Nations International Children's Emergency Fund (UNICEF) has offered to bear the foreign exchange cost of the import of pottasium lodide or iodine needed for iodisation of common salt.

The present demand of common salt, estimated at around 40 lakh tonnes annually is expected to increase to 50 lakhs tonnes by 1990. Twelve public sector plants have the iodisation facility now. The Government has liberalised the licensing policy, enabling the private sector to enter the field.

(The Hindu 1 December 1984, 9)

346 Processed spice products

During the year 1980, EEC have imported 3,817 tons of products spice products, the important among them being West Germany and UK. USA imported 1,174 tons. Other main countries are listed below:

Belgium	-	434 tons
Switzerland	-	355 tons
Australia	-	300 tons
France	-	242 tons
Italy	-	215 tons
Netherlands	-	138 tons

Of the spice mixtures entering international trade, curry powder and exporters of curry powder and paste make up a large part of the total volume. The two largest manufacturers are India and UK. UK is also one of the largest importers of these items.

Singapore has emerged in recent years as an increasingly large exporter. Japan is the third largest manufacturer of curry powder and it consumes almost its output, although small quantities are shipped to Hong Kong

World trade in curry powder and paste, which grew considerably during the year 1976-1980 period, was an estimated 3,500-4,000 tons in 1980, with India supplying about two thirds of this total.

The middle Eastern countries as a group increased their purchases of curry powder from India alone from 235 tons in 1976/77 to 890 tons in 1979/80, accounting for 15% and 34% respectively of India's total curry powder exports in those two years. The other market, that of USA, which was previously only a small market for curry powder and paste, increased its imports over 1976-1980 by one half to 1,170 tons in 1980.

In the Middle East there is a known consumer market potential for both spice mixtures and prepacked spices. In recent years, processors and packers in developed, more traditional end-use markets such as UK and FRG have become increasingly cost-sensitive by, for example, relocating processing facilities to lower cost areas. In this respect, developing countries could also look at possible intermediate stages of processing (e.g. grinding the spice for export, or even packaging) leaving the responsibility of merchandising to the end-user country. Possibilities for closer co-operation between exporter and industrial user/packer should be explored as positive benefits that can be derived by both sides.
(Spices News Letter, 18(8), 1984, 2-3)

PRODUCTION (INDUSTRIAL)

347 Sugar production

The total production of sugar in the months of September and October 1984 was about 17,000 and 18,000 tonnes respectively.

The total closing stock of sugar with the factories as on 31st October 19 was 17,67,000 tonnes as against 37,75,000 tonnes on the same date last season.
(Indian Sugar Mills Association,
Press Release, 28 November 1984)

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EXPORT

348 Priority for export units

The 100 per cent export oriented units holding green cards will get priority treatment from Air India and Indian Airlines for lifting finished products manufactured by these industries for foreign markets.

On a suggestion from the Commerce Ministry, the Ministry of Transport and Tourism has accorded priority treatment for the export cargo. The Ministry has so far issued 102 green cards to the 100 per cent export oriented units.
(Cardamom, August 1984, 17)

349 Rising trend of cashew exports

India's exports of cashew kernels during the first quarter of 1984 rose to 5,010 tonnes from 4,543 tonnes in the same period last year registering a 10 per cent increase. Export earnings were also higher at Rs. 269.4 million as against Rs. 165.2 million during the previous year. The average unit export price in the current year was Rs. 53.77 per kg as against Rs. 36.36 per kg in 1983 and Rs. 57.03 per kg in 1982

USA with an offtake of 2,888 tonnes, re-emerged as the largest buyer of Indian cashews during the period under review. This represented 57.6 per cent of the export. The other important markets, viz. Netherlands (458 tonnes), Japan (392 tonnes), Canada (186 tonnes), Kuwait (182 tonnes), Czechoslovakia (181 tonnes) and New Zealand (64 tonnes) also increased their offtakes considerably during the year period under review.
(Economic and Commercial News 14(32), 1984, 4)

350 Tea export will continue to be regulated

Export of tea will continue to be regulated and auction systems streamlined to control tea prices in the domestic market and to ensure high earnings in the export market in 1985. This was decided at a meeting between the Commerce Minister and representatives of the tea industry here today.

The industry was represented by the Consultative Committee of Plantation Associations of India, the chairmen of various auction committees and representatives of brokers.

It was agreed that exports should continue to be carefully and closely regulated in 1985 to ensure stable prices in the domestic market. It was felt

that the regulatory measures introduced in 1984 had led to price stability and a comfortable stock position with stocks at the end of the year being much hig than at the end of 1983. As a result of these measures, adequate supplies of tea was at reasonable prices have been assured in the domestic market during t lean season, January to March, 1985.

It was also agreed that in spite of the comfortable stock position, there was hardly any scope for CTC exports in the period January to March, 1985. Exports would have to be regulated by fixing total targets of different variet of tea for the whole year, which would have to be broken into targets for expo of orthodox tea and CTC tea separately, it was felt.

(The Hindu, 29 November 1984, 9)

351 Export duty on coffee up

Export duty on coffee has been increased to Rs. 720 from Rs. 640 a quinta with effect from October 9. The revision follows increase in the internationa prices.

The duty was raised by Rs. 110 a quintal in the first week of May. The International Coffee Organisation has raised India's export quota to 43,693 to for 1984-85 from 41,722 tonnes

(The Hindu. 12 October 1984, 9)

352 Export of processed foods 1981-2

	Quantity		Value Rs.
Apricot kernal	1,63,559	kg	18,88,581
Puffed Rice/corn flakes	7,34,944	kg	48,52,131
Malt and Malt flour	5,258	kg	48,873
Macaroni Spagaheti etc	6,359	kg	76,174
Coconut desiccated	51,676	No.	1,48,300
Groundnut roasted	67,338	kg	14,81,749
Natural honey	175	kg	3,875
Agar Agar	15,100	kg	1,84,825
Frozen Vegetables	29,124	kg	3,40,091
Vinegar & substitutes	9,216	kg	69,000
Prepared baking powder	17,058	kg	2,64,723
Glucose solid	61,676	kg	6,32,229
Other general preparations	10,030	kg	68,68,825

	Quantity		Value
Soups & Broth	1,46,700	kg	31,80,590
Pan Masala including Scented supari	2,29,534	kg	83,64,542
Other food preparation	17,35,082	kg	1,81,07,188
Mango slices in Brine	10,97,112	kg	75,47,290
Eggs in shell	7,59,355	Hnd	3,77,37,457
Egg and yolk not in shell	355	kg	23,550
Compound preparation for Beverages	1,64,849	kg	19,27,272
Other grape wine	25,800	L	3,41,217
Beer from malt	80,773	L	6,29,062
Whisky	1,69,555	L	25,16,749
Brandy	54,120	L	5,97,115
Liquors	92,366	L	10,32,142
Others	33,208	L	2,53,964
Gin	1,77,414	L	11,19,972
Rum	1,44,300	L	14,25,228
Others	42,301	L	4,63,528
Wheat Bran	33	T	33,446
Malted milk	9,99,172	kg	1,60,82,830
Butter fresh	570	kg	10,360
Butter oil	33,444	kg	15,91,896
Butter melted	2,39,254	kg	84,69,097
Tapioca chips	1,13,00,437	kg	1,46,46,650
Tamarind seed and seed powder	49,40,670	kg	2,01,39,304
Papad	21,38,632	kg	2,19,10,819
Cocoa Butter	1,22,570	kg	32,80,119
Walnut in shell	28,28,937	kg	3,79,20,125
Walnut kernal	42,32,447	kg	7,32,92,947
Mushrooms	46,545	kg	2,11,20,014

(India Exports News Letter 7(5), 1984, 6-13; 7(6), 1984, 15-19)

TRADE INFORMATION

353 New Market for Pre-Extruded Pellets

Dali-Fresh Inc. of Tullytown, Pennsylvania, USA has become the premier snack-food processor to market products produced from pre-extruded snack pellets a new idea of the British (see Food Engineering International, November, 1983, page 49). Trial-size, colour-coded packages of the new products, called Dali Fresh Potato Curis, are being distributed to tempt snack-hungry consumers. The potato curls come in three varieties -- cheese, barbecue and sour cream and onion Processors will appreciate the minimum capital investment necessary to add this item to their line. Short development time is another plus. The crunchy snacks are formed when the pellets expand to three times their size during frying. The

result: A light, cruncy snack containing 50% less oil that is less filling. Dali Fresh, Tullytown, Pennsylvania, U.S.A.
(Food Engineering International, July/August 1984, 12)

354 Centre for Trade information

The Commerce Ministry has decided to set up a National Centre for Trade Information (NTCI) similar to the Japan External Trade Organisation (JETRO) and Korean Trade Promotion Corporation (KOTRA). A two-member study team comprising of the Additional Secretary and Economic Adviser in the Commerce Ministry will visit Japan and South Korea shortly to study the two trade organisations in the respective countries. The evaluation and experience of these two Trade Organisations will be used as the basis for planning the NTCI.
(Cashew Bulletin 21(7), 1984, 4)

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

355 Standards of weights and measures Rules 1984 (Third amendment)

G.S.R. 393 (E):- In exercise of the powers conferred by section 83 of the Standards of Weights and Measures Act, 1976 (60 of 1976), the Central Government hereby makes the following rules further to amend the Standards of Weights and Measures (Packaged Commodities) Rules, 1977, namely:-

1. (1) These rules may be called the Standards of Weights and Measures (Packaged Commodities) Third Amendment Rules, 1984.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Standards of Weights and Measures (Packaged Commodities) Rules, 1977:-

(i) in proviso (C) to sub-rule (1) of rule 6, in item (IV) the words "edible oil, ghee or vanaspati" shall be omitted;

(ii) rule 22 shall be omitted.

(The Gazette of India No 170, Part II - Section 3-Sub-section (i) 23-5-1984

356 Vegetable Oil Products Central Order (amendment)

G.S.R. 692 (E) -- In exercise of the powers conferred by subclause (1) of Clause 4 and sub-clause (1) of clause 4B of the Vegetable Oil Products

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Control Order, 1947, the Vegetable Oil Products Controller for India hereby makes the following Order further to amend the Order of the Government of India in the erstwhile Ministry of Civil Supplies No. G.S.R. 717(E), dated the 26th December, 1980, namely:-

In the said Order, in the Table, in the proviso to item I, in column (1) for the figures, brackets and words "80 per cent (eighty per cent)" the figures, brackets and words "85 per cent (eightyfive per cent)", shall be substituted.
(The Gazette of India No:331, Part II, Section 3-Sub-section(i) 9.9.1983)

357 Prevention of Food Adulteration Rules (First Amendment) 1984

G.S.R. 500(E)-- Whereas certain draft rules further to amend the Prevention Food Adulteration Rules, 1955 were published as required by sub-section (1) of section 23 of Prevention of Food Adulteration Act, 1954 (37 of 1954) with the notification of Government of India in the Ministry of Health and Family Welfare (Department of Health) No. G.S.R. 87(E), dated the 1st March, 1984, in the Gazett of India, Extraordinary, Part II, Section 3, Sub-section (i), dated the 1st March, 1984 at pages 1--6, inviting objections and suggestions from all persons likely to be affected thereby before the expiry of ninety days from the date on which copies of the Gazette of India in which the said notification was published were made available to the public;

And whereas the copies of the said notification were made available to the public on 1st March, 1984.

And whereas the objections and suggestions received from the public on the draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (i) of section 23 of the said Act, the Central Government, after consultation with the Central Committee of Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:--

RULES

1. (1) These rules may be called the Prevention of Food Adulteration (First Amendment) Rules, 1984.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In rule 7 of the Prevention of Rules, 1955 (hereinafter referred to as the said rules), in sub-rule (3), for the words forty-five days", the words "forty-days" shall be substituted.

3. In rule 9-A of the said rules, for the word "immediately" the words "within a period of ten days" shall be substituted.

4. For rule 37-A of the said rules, the following rule shall be substituted, namely:--

"37-A Manufacture of proprietary foods and infant food:-

(1) An article of infant food whose standards are not prescribed in Appendix 'B' shall be manufactured for sale, exhibited for sale or stored for sale only after obtaining the approval of such article of food and its label from Government of India.

(2) In cases of proprietory foods, the name of the food or category under w it falls in these rules shall be mentioned on the label and where such foods do not fall under any of the standards prescribed in Appendix 'B' the names of ingredients used in the product in descending order of composition shall be given on the label, provided that the labels of artificial flavouring substances may not declare the chemical names of flavours under this rule. In case of natural flavouring substances or nature-identical flavouring substances, the common name of flavour shall be mentioned on the label.

Explanation for the purposes of this rule--

(a) "Infant food" means any food which may be used for partial or total replacement of breastmilk, commonly called breastmilk substitute and includes infant milk food and any food suitable as a complement to breastmilk, to meet the nutritional needs of the infant after 4 months of age, commonly called "complementary food", breastmilk supplement" or Weaning food".

(b) "proprietary food" means a food which has not been standarised under the Prevention of Food Adulteration Rules, 1955".

(The Gazette of India 250, Part I-Section 3-Sub-section (i) 9-7-84)

358 Chlorides allowed as meat tenderizers

FSIS is allowing the use of potassium chloride, calcium chloride, and magnesium chloride as tenderizing agents in meat and poultry products as petitio by Cooch Blue Ribbon Meats, Inc. Previously, only enzyme tenderizers could be used. The petitioner maintains that these inorganic chloride salts cause a chan in the ionic environment of the muscle which results in increased muscle tender Details are in the Federal Register of May 4.

(Food Technology 38(7), 1984, 35)

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359 TiO_2 not needed in soy isolate

USDA's Food Safety and Inspection Service is no longer requiring the addition of titanium dioxide to isolated soy protein used as an ingredient in meat and poultry products. TiO_2 had been required to allow FSIS to analytically detect the amount of isolated soy protein used in meat and poultry products. The action was taken in response to a petition filed by Archer Daniels Midland Co., Grain Processing Co., and Ralston Purnia Co. Details are in the Federal Register of May 9.
(Food Technology 38(7), 1984, 36)

360 Code of Practice on processed foods (Malawi)

The Malawi Standards Board has published a code of practice on the hygienic conditions required for food and food processing units or companies. According to a Malawi Bureau of Standards Press Release, the code is expected to be the authoritative reference document for all public health institutions at local or central government levels. It has also published five standard specifications on Mulanje Peak Products manufactured by Admarc Canning Factory on Canned Pineapples, Canned Tomato, Tomato Juice, Tomato Sauce and Tomato Puree, the statement said.

The use of these standards in industry under the Bureau's Certification Mark Scheme will not only maintain the high quality of food products but also increase consumer confidence and distract consumer loyalty to other foreign brands. The quality control, sampling inspection and testing required for the Mulanje Peak Products will enable the Bureau to establish and use new technologies in Malawi for the first time. The Bureau is now looking forward to an application from the manufacturer for a permit to use its mark of quality, the statement added.
(Spices Newsletter 18(7), 1984, 4)

361 Antibiotic traces found in milk

Traces of streptomycin, an anbibiotic, used for treating tuberculosis and other diseases, have been detected in milk by scientists at the National Dairy Research Institute (NDRI) Karnal, India.

The traces varied from 10 to 20 mg per millilitre of milk and it was on the increase because of continuous and indiscriminate use of the antibiotic in the treatment of cattle diseases.

The scientists conducted a survey in which they tested about 200 milk samples collected from the milch herd, maintained at the Institute as well as nearby places. They found that about five of the samples contained streptomycin.

The situation is of great concern because of the appearance of these antibiotics in the milk of treated animals, irrespective of the mode of application, the scientists said.

(The Hindu 6 Oct. 1984)

362 Domestic water softener

WTC manufacture a PVC fabricated, ion-exchange type water softener for domestic use. The softener can be fitted next to the water tap in the bathroom/kitchen; or in series with well water pumps, or inlay pipelines of overhead water tanks/tank outlet supply lines. The unit converts raw water of hardness up to 5,000 PPM to less than 5 PPm. The treated water reportedly foams well with ordinary detergents and soaps. The unit produces soft water at a flow-rate of from 500 to 1,000 LPH, either continuously or intermittently. The built-in digital volume meter regularly shows the volume of water being treated. on production of 3,000 litres of soft water, it gives a bell ring. The bell system works on a 1.5 VDC cell which lasts over a year, it is claimed. The softening cycle is continuously repeated by regenerating (cleaning) the column with 3 kg of sodium chloride. Cleaning is done in 10 minutes. An operation manual is supplied with the unit. Also available are models of higher capacities, to suit requirements. The unit is also suitable for use in industrial process boilers to minimise scale formation. Contact The Water Treatment Company 48-A Sivanar St.3 P.O.Box 625, Salem 636 006 TN

(PFNDAI Newsletter No: 24, 1984, 2)

363 Bananas for ulcer cure

Eating green bananas may give you a stomach ache, but they may prevent you getting stomach ulcers, according to a group of researchers at Aston University. The Green bananas are used as a staple vegetable in many Third World countries.

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The Aston group induced ulcers in rats by fasting them for 48 hours and then treating them with aspirin. Dried banana powder (obtained from India, the West Indies, and a Birmingham market) added to the rats food certainly worked, both a preventive and as a curative agent:

Lewis and his coworkers compared the effectiveness of the banana diet with a number of reference compounds that are commonly used in ulcer treatment cimetidine, prostaglandin E_2 $(PGE)_2$ 5rhydroxytryptamine (5-HT), N^6 G^2-dibutyryl adedosine-3' 5'-cycle monophosphate (db cyclic AMP) and Al (OH) (used in prophylaxis only) Cimetidine, PGE_2 and db cyclic AMP which were only effective in preventing ulcers, not in curing them once formed -- unlike the banana extract while 5-HT provided no protection. Banana powder was more effective than $Al(OH)_3$ in preventing ulcer formation.

What the banana extract seems to do is promote the growth of protective mucoas cells in the stomach lining (over ulcers if already formed). whereas drugs, like cimetidine reduce the secretion of stomach acids. This cell promoting mode of action may be similar to that of other antiulcerogenic natural products such as carbenoxolene, and gefarnate from white headed cabbages. Unlike carbenoxolene, however, the extract does not have any obvious side effects *(PTI Science Service 3(20), 1984, 22-23)*

364 Study of Street Foods

Under a contract with the Office of Women in Development of the U.S. Agency for International Development, the Equity Policy Center of Washington, D.C. has been studying the dynamics of the street food trade in four countries: Senegal, Bangladesh, Indonesia, and the Philippines. Results of the study are not yet available; but Dr. Monique Cohen, the Project Director, recently issued a 40-page paper entitled The Urban Street Foods Trade: Implications for Policy, which sets the stage for the data to come. Her warning to planners Dont sell street foods short; they fill an important need, both from the standpoint of nutrition and that of employment. (Dr. Cohen cites the example of Iloili City in the Philippines, where 22 percent of the family food budget is spent on street foods, and one-quarter of the labor force derives income from this source.) Certain adverse side-effects of the trade, such as traffic congestion and improper sanitation, may need regulation, Dr. Cohen concludes;

but she argues that its many constructive aspects should not be endangered. For a copy of the paper, write: Equity Policy Center; 2001 S Street, N.W.; Suite 420; Washington, D.C. 20009 USA.
(League for International Food Education 17(3), 1984, 3)

365 Caffeine helps prevent molds and toxins

The caffeine that occurs naturally in coffee and cocoa beans and kola nuts gives them a built-in resistance to contamination by toxins produced by fungi. These fungi commonly appear as molds.

Researchers with USDA's Agricultural Research Service think the caffeine disrupts fungal cell growth by thwarting its ability to use carbohydrates.

Usually, improper storage in hot, humid climates causes the toxin-producing molds to contaminate beans, nuts and a variety of other foods, like fruits and vegetables.

Caffeine has many well-understood effects on plants and animals, but the reason for its ability to inhibit the creation of fungal toxins remains a tantalizing mystery for food safety researchers. Further studies of caffeine's suppression of toxins could lead to better understanding and prevention of mold growth and toxin production in other foods, as well.
(Food Production/Management 106(9), 1984, 32-33)

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

366 Rice milling centre for extension services

A Regional Extension Service Centre for modernisation and communication of rice milling technology has been recently established at the College of Agriculture, Pune. The main object of this centre is to develop and communicate modern Rice milling technology to the State of Maharashtra, Gujarat and Goa. Associate Dean, College of Agriculture, Pune and Head, Agriculture Processing Deptt., Agril, Engineering College, MPAU, Rahuri will look after the Administrative and technical supervision of this centre

A total grant of Rs. 14.30 lakhs has been sanctioned by the Food Department Agril. Ministry, Govt. of India, for the first five years on expenditure of this Centre.
(University News 22(36), 1984, 14)